DECEMBER, 1950

American Engineer

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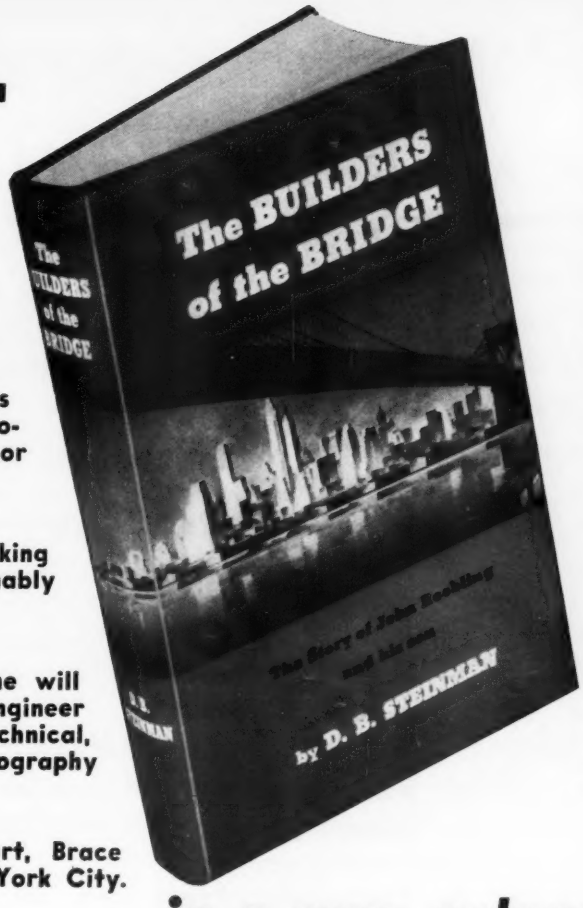

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"Loyalty to a profession can elicit some of the best qualities in human nature, but in excess it can also produce a narrow outlook and degenerate into collective pride and avarice."

—THE LONDON, ENGLAND, TIMES

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• AN EDITORIAL •

No One Will Blow A Whistle

American troops during World War II were first committed to battle against the Germans of Rommel's tank corps. These fresh youngsters, straight from a democratic land where for years the only gun to be found was in the hands of a hunter, had behind them the prescribed training given to most recruits in most armies. But despite the training, they had an almost sportsmanlike attitude toward war that puzzled grizzled veterans. As an officer said at the time: "They think it's like football; if things get too rough someone will blow a whistle." Needless to say, no one blew a whistle either on those wind-swept sands, or later in the mountains of Italy or during the bitter cold of Bastogne. Once again, America had to learn the hard way that war was for keeps. Once we were aware of it, we went on to victory.

What has happened the past few weeks on the technical manpower front, reminds us of the above. Everyone agrees the shortage of engineers in the years ahead will reach an alarming figure. A survey released by the manpower committee of the American Society for Engineering Education predicted that "while this country needs a minimum of 30,000 new engineers annually, within four years the annual output from our colleges and universities will fall below 10,000." Influential newspapers and organizations took up the hue and cry. The New York *Times* stated editorially that "even if we take the most cheerful view it is plain that the Selective Service will have to modify its position regarding the necessity of deferring engineers and scientists." The National Association of State Universities and the Association of Land-Grant Colleges, attacked General Hershey's tentatively approved plan to defer "bright" students to study anything they choose, by calling attention to the fact that students would shun tough courses such as engineering, and take public speaking instead. Our own Society's Board of Directors, meeting in Little Rock, Arkansas, came up with a policy statement on the entire manpower problem, offering further ideas on keeping engineering students in school. We've gotten everything but governmental action. At the moment, the attitude in those quarters seems to be unrealistic. After all if things really get serious, some one will blow a whistle.

A few leaders in the profession said recently that the whole deferment question for engineering students is so complex that it is a matter for Congress to handle. This may be true and if it is, there seems little chance of coming up with a workable solution before the new Congress meets next year. The new Congress and administrative officials have many plans such as NSPE's before them to guide them. Much of the spade work has been done to assist them. They can if they will, act quickly enough to establish policies to offset present trends and shortages of engineering students in our colleges. There is still time to salvage some of our talent. The democratic process of government must by necessity be slow, but it need not and must not be derelict.

Here's Your Seat In The Gallery . . .

82nd Congress–Engineering Background

By Milton F. Lunch
Legislative Analyst, NSPE

ONCE again the nation has survived its biennial orgy of oratory, accusations, charges, countercharges, and threats of disaster. The campaign is over, the voters have spoken, and the union still stands.

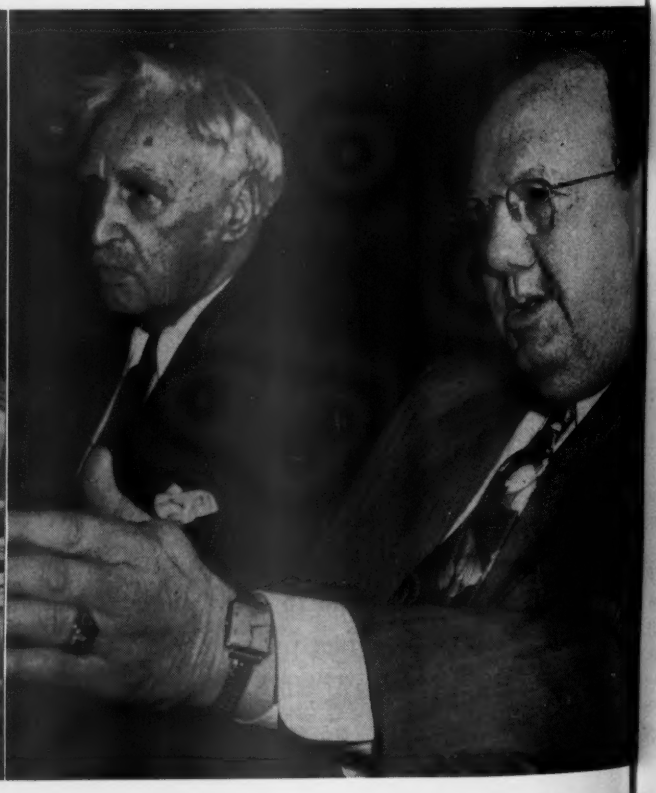
Now that enough time has elapsed to impartially weigh the results of the election it is obvious that no earth-shaking changes are in the cards for the future. The pattern of political history was repeated in general. The party in power lost some of its support and the "outs" picked up enough additional votes in the Senate and the House to cheer them on for the next try two years hence when the "Presidential Sweepstakes" will be the prize attraction.

For the engineering profession, the most significant factor about the election was the resounding triumph of "Mr. Republican"—Senator Robert A. Taft of Ohio. Taft is the symbol of the Taft-Hartley Act and this law embodies the provisions which guarantee to professional engineers and other professional employees their basic rights of self-determination in labor-management relations. Labor leaders are still shaking their heads in bewilderment at the outcome of the Ohio election. After pouring untold sums of money into the campaign to defeat Senator Taft, with the law bearing his name as their chief weapon, the labor leaders awoke on November 3rd to find that Taft had not only won re-election by the greatest margin in his political career but had carried practically every labor stronghold in the state.

The results in other key elections, coupled with Taft's victory, make it almost certain that there will be no real campaign to repeal the Taft-Hartley Act in the next Congress. Whatever changes may be made in the labor law will come from its friends, not its enemies.

Some of the Taft-Hartley Act's strongest enemies will no longer be present in Congress. Claude Pepper of Florida is being replaced by George A. Smathers who voted for Taft-Hartley as a member of the House. Glen H. Taylor of Idaho will be among the missing. The Chairman of the Senate Labor Committee—Elbert D. Thomas—was defeated by Wallace F. Bennett of Utah. Bennett is a former president of the National Association of Manufacturers. In addition the Democrats lost their leaders in the No. 1 and No. 2 positions—Senator Scott Lucas of Illinois being defeated by Everett M. Dirksen, a former member of the House, and Senator Francis J. Myers of Pennsylvania be-

One friend of Taft-Hartley went down in defeat. He was Senator Forrest Donnell (R-Mo.) pictured on the far left below with Senator Wayne Morse (R-Ore.) Shown below on the far right is Senator Homer Capehart (R-Ind.) with former Rep. Charles A. Eaton (R-NJ.). Capehart and other Mid-westerners will wield great influence over such foreign aid bills as Point 4.



ing defeated by Governor James H. Duff. Lucas is the Democratic floor leader and Myers is the majority whip.

The net result of all the changes in the Senate places the Democrats in technical control, having 49 votes to 47 for the Republicans. The political facts of life, however, actually put the conservative element in easy control of the situation. With the combination of conservative Democrats and the Republicans the administration will have tough going to put through much of its "Fair Deal."

The situation in the House follows the same pattern —a gain for the Republicans with the Democrats still in technical control. While the Democratic majority in the House is larger than in the Senate due to a larger membership the coalition of conservatives will again control the situation.

The defeat of Senator Thomas of Utah will bring about a reshuffling of the Senate Labor Committee with Senator James E. Murray of Montana taking over the chairmanship under the rules of seniority. Senator Murray is just as anti-Taft-Hartley as was Senator Thomas. Another shift in the Committee will result from the defeat of Republican Senator Forrest C. Donnell of Missouri, a friend of Taft-Hartley, by Thomas C. Hennings, Jr. who campaigned for repeal of the T-H law. The Labor Committee is now composed of eight Democrats and five Republicans but this ratio is scheduled for revision to seven seats for the Democrats and six seats for the Republicans.

Other major committee chairmanship shifts will be: Allen J. Ellender of Louisiana replacing Elmer Thomas of Oklahoma as chairman of the Agriculture and Forestry Committee; Richard B. Russell of Georgia moving up to the chairmanship of the Armed Services Committee in place of Millard E. Tydings of Maryland.

On the House side the chairmanship of the Labor Committee will stay with Graham A. Barden of North Carolina, who succeeded the late John Lesinski of Michigan. Barden was opposed to the repeal of the Taft-Hartley Act and was one of those who expressed strong support for the professional provisions of the law.

The big question mark, of course, hangs over Secretary of State Dean Acheson. New Republican pressure may be enough to remove him. He is shown with Secretary of Agriculture Charles Brannan.

In other fields of interest to the engineering profession it may be expected that the pattern will be conservative domination. This should rule out any possibility of approval for such legislation as valley authorities or expansion of spending for power projects or reclamation. In fact, the keynote of the new Congress is likely to be a very cautious approach to domestic spending and a cutback in some of the current activities. This position is likely to mean less appropriations for such activities as

One made it, two didn't. Mr. Republican, Robert A. Taft of Ohio, right, who co-authored the famous labor bill, won easily. Majority leader Senator Scott Lucas (D-Ill.), left, lost, as did Senator Elbert D. Thomas, (D-Utah), center. Thomas was anti Taft-Hartley.

Representative Carl Hinshaw, left, (R-Calif.) a prominent engineer member of the House, was returned to his seat. On the right is the new senator from Utah, Wallace F. Bennet, former president of the National Association of Manufacturers. He displaced labor's great friend, Elbert D. Thomas.

advance planning of public works, road construction, hospital and airport construction, and other major construction activities.

It is certain, however, that no amount of reduction in domestic spending will offset the increased appropriations for national defense needs. Party labels are meaningless when it comes to this item and the changes in the 82nd Congress will have little effect on the increased sums needed for defense purposes.

One of the first tasks of the new Congress will be to review the entire picture on mobilization of manpower and particularly to decide on a new and revised selective service law. The manpower problem is of major interest to the engineering profession because it involves the question of deferring engineering and science students as well as the need for trained engineers in industry. This problem has become so acute and complex that many feel it has passed the stage where it may be handled by administrative action. Present opinion indicates that the new Congress will have to spell out the balances of national interest in the long-range competition between military needs and civilian needs.

Also of great interest to the engineering profession is the state of civil defense preparations. While this is primarily a function of the administration through the National Security Resources Board the protests have been accumulating from cities and counties that insufficient planning has been done. The new Congress may also step into this picture and attempt to lay down a more precise line of responsibility.

In the international field, the administration appears to be in for some heavy weather. Senator Taft declared upon his return to Washington that isolationism is dead and that there will be no attempt to revive it. Instead, he declared, that he and his supporters would demand a complete re-examination of United States obligations and commitments in the international aid field and would insist upon a tightening up all down the line. Secretary of State Acheson has lambasted the "re-examinists" as being another variety of isolationists. Nevertheless, it is clear that foreign aid spending will get a rough going-over before further appropriations are made.

The stage has been set for this battle by the recent report of Gordon Gray, Special Assistant to the President, and former Secretary of the Army, who headed up a special study group on the foreign program. The Gray report, endorsed by President Truman, calls for a continuation of the Marshall plan for three or four years beyond its scheduled expiration in 1952. The coalition bloc will be in a position to act on this proposal before the next Congress but the lines will be split on the international issues as many of the Republicans side with the administration in this field.

Another facet of the Gray Report of particular interest to the engineering profession relates to the proposal to extend the Point Four program of technical assistance to underveloped nations. It is recommended in the report that the Point Four program be expanded to provide 600 to 800 million dollars a year in loans and 500 million dollars of grants. The funds for the current Point Four program total only $34,500,000 for the present fiscal year and this amount was obtained only after a desperate appeal by the administration.

With this background attitude from a Congress which was considerably more friendly to the administration it is extremely doubtful that the more conservative 82nd Congress will favorably consider the recommendation for spending over a billion dollars a year on the technical assistance program.

It is generally believed that President Truman had intended to call the 81st Congress back into session before November 27th when the session will resume under the previous adjournment order. The election, however, has cancelled that idea. The final session of the 81st Congress will be, for many of its members, a "lame-duck" session and to have called them back earlier than November 27th would not have resulted in any advantage in preparing for the next Congress in view of the defeat of the administration leaders. As it stands now, when Congress meets on November 27th it will confine itself to a few major issues left in abeyance at the adjournment rush. Among the questions scheduled for consideration are an excess profits tax (which may be put off for the next Congress), statehood for Alaska and Hawaii, and preliminary hearings on the selective service extension.

One of the few professional engineers in Congress will be gone when the legislators meet next January to start the 82nd Congress. Senator Harry Darby of Kansas was not a candidate for re-election, having been appointed to replace the late Clyde Reed. Darby's place will be taken by the Governor of Kansas, Frank Carlson. Representative Carl Hinshaw of California, a prominent engineer member of the House, will return to his seat.

At best the 82nd Congress will face a grim two years—during which they will have to live with the unpleasantness of greater military mobilization, domestic controls, higher taxes, and a tense international situation which may erupt into all-out armed conflict at any time.

The engineering profession will have a vital interest and an important stake in the deliberations and decisions of the 82nd Congress. Whether it be labor law, foreign technical aid, domestic construction, national mobilization, or social reform, the profession will again realize the importance of knowing what Congress is doing and of presenting its viewpoint of the policies which are best for the nation.

AFTER ECA, WHAT?

by

W. M. CHAPMAN, Industry Manager
Westinghouse Electric International Company
New York

Two years ago the United States was five months along in the tremendous undertaking called the Marshall Plan. By the middle of 1948, $3.5 billion dollars had been expended in this unprecedented outpouring of our national wealth to aid the stricken countries of Europe. Already observers noted a new spring in the step of our European friends. In the following two years, ECA has wrought an inspiring change in the industrial and political landscape of western Europe. In fact, we have nearly forgotten the seemingly hopeless situation in Europe at the time the program was initiated.

In terms of our common interests—the moving of goods—let us review a few outstanding facts which effect world trade today. It is not my intention to make any long-range predictions with regard to the question, After ECA, What? However, I do believe that it is possible to outline the pattern of recent trends as a general guide for operating in a complex world market.

In appraising the value of ECA, we should recall some of the conditions which Europe faced when the Marshall Plan was conceived. In some places industrial production was practically at a standstill; in others it was scarcely adequate to replenish war losses. Communism was thriving on the low morale of the people of Europe, and there was danger that democracy and free enterprise would be pushed back to the English Channel.

In the course of spending about $10 billion, the Marshall Plan has achieved a fair portion of its aims. In fact, even by the middle of 1949 western Europe's industrial production already had risen 15 per cent above pre-war levels; agricultural output was more than 95 per cent of the pre-war figure; and Europeans were exchanging goods among themselves to the tune of $9 billion per year.

In addition, ECA may be credited with bringing about the first practical steps toward unification of western Europe, which has been the hope of people for centuries. There have been many attempts by dictators to turn Europe into a political and economic unit, but under the Marshall Plan there has been some success in uniting what remains of Europe on a democratic basis. As part of this movement, we have seen a succession of political and economic projects aimed at breaking down barriers to trade and peaceful cooperation. Each of these attempts has begun in a blaze of publicity before settling down to a long period of disagreement as to the methods of carrying them out. Nevertheless, each new proposal left western Europe farther along the way to unity. The Schuman plan for the merging of the French and German coal and steel industries, whatever its flaws, is one example of the attempt to cut across national barriers. The European Payments Union represents a different phase of the same movement. It is a credit mechanism aimed at freeing European currencies so that trade can flow easily between one country and another. ECA also has used its influence in breaking down the method of trading by barter—getting the concession from each country that a portion of its imports be exempt from import restrictions.

In all these attempts the United States has used its position as financial backer of Western Europe to prod these countries out of their centuries-old trade rivalries and nationalistic suspicions. England has been the chief holdout, forming an obstacle to the working of both the Schuman Plan and the European Payments Union, partly because of her difficulties with maintaining the position of the pound sterling as a leading international currency. There remains the danger that the gains made toward opening-up Europe to the free exchange of goods will be lost if the United States does not exercise a stronger influence in the unification movement.

Nevertheless, Marshall Plan funds have been spent pretty wisely, on the whole, in rebuilding and expanding such basic industries as power, transportation, metals, mining, and petroleum refining. The materials and equipment provided under ECA now form the basis for an industrial machine that can be put to work for the defense of the West as well as for the production of many of the goods of everyday life. Every country in the Atlantic Pact has the ability to some degree to produce arms for the common defense, reducing by just that amount the defense burden on the American taxpayer.

A further result of the great flood of machines and materials which has been poured into Europe under ECA is a new emphasis on efficiency and modern methods. The destruction of much of Europe's old machinery during the war has torn away some of the vested interests in traditional ways of producing goods for a limited market. Europe needs our production methods almost as much as our machines, and whenever such a need exists there is an opportunity for the materials handling industry, which represents, in many instances, the margin of difference between United States and European industry. Although Europe may not realize so thoroughly as we the role of materials handling as "the handmaiden of mass production," a growing number of production men in Europe are ready to think in American terms.

You have probably heard that the average American working man today has at his disposal more than seven horsepower of machinery, in contract with a fraction of this power in the early days of the age of electricity. But the significant story of our industrial progress is not simply that each worker can call on so much horsepower; it lies in the remarkable development of methods and equipment for the handling and processing of materials, and the movement of finished products to the consumer.

American industry entered a new era when the moving of materials between one operation and another began to be delegated to machines. Now Europe will have to make use of similar equipment to carry through the process of industrialization, American-style, which has already begun under ECA. When you consider some of the projects for which ECA is responsible, it becomes clear that the equipment you make will be in demand for many years to come. The trend toward modernization and efficiency is illustrated by the modern steel mill equipment installed in northern France, in Belgium, and in Italy. The modernization process has affected the coal region of northern France, which has received generating equipment comparable in every respect to the equipment used in the United States.

Electrical networks in Europe are being extended and integrated to form national power supplies sufficient for industry.

These are some of the actual accomplishments in the industrial development of Europe. However, I also would like to review briefly some of the developments still on the agenda throughout the world which offer export possibilities.

Besides large national developments for entire industries involving most of the leading plants of one country, there are many individual projects in the basic industries being sponsored by ECA. A $3 million pulp and paper mill for Austria, increased steel facilities for Austria, and coal mining equipment for Greece are only a few examples. Each of the programs and individual projects should be looked into thoroughly to find the possibilities for materials handling sales.

Furthermore, not all developments are taking place in western Europe. In Turkey, for example, ECA has earmarked $45 million for the development of the government owned Zonguldak coal field, which involves considerable transportation and other equipment. In the Far East, Thailand has been put down for $8 million for the improvement of its railroad facilities. The World Bank recently approved a $100 million loan to Australia for development of shipyards and various industries. In Latin America, some of the biggest news is being made in Venezuela, where U. S. steel companies are developing new sources of iron ore to supplement our local resources. A large increase in sugar production is being planned by the government, and a big hydro project on the Caroni River will fit in with plans for an expansion in aluminum facilities.

These are only a handful of the development projects throughout the world which can be, and are being translated into orders for conveyors, cranes, hoists, fork trucks, and other materials handling equipment. But while these are signs of a reasonably healthy export market in the near future, by no means do they constitute an open invitation for those inexperienced in foreign trade to go forth in all directions. Export business is an excellent means of reducing your overall production costs by expanding the market for your products. A foreign market for your products is not built overnight, but you can lose it overnight. If you want to make exports a profitable and regular part of your operations, credit and collection factors have to be taken into account; and these factors must be weighed in terms of both the long-range and the short-range sales trends.

Both long-range and short-range trends are constantly affecting our prospects for selling our goods and our know-how abroad. As an example of a long-term trend to be noted by exporters, some encouraging evidence may be reported of a return to the principles of private enterprise in a few areas abroad. The most notable example of this trend is Turkey, which has decided, after some 25 years, to give private enterprise a freer hand, removing to some degree the shadow of Government competition in industry. Following some persuasive arguments put forward by members of the World Bank, Turkey has agreed to establish a new financial agency to encourage private enterprise in industry and agriculture. It even looks as though Turkey will refrain from taxing these enterprises out of existence.

The new administration in Australia took office with a mandate from the nation to free private enterprise from socialist restrictions, and it is likely that Australia will offer considerably more encouragement to foreign investors than was the case under the Socialist regime. In addition, many other countries, especially in Latin America, are negotiating with the United States on treaties of friendship and commerce which will set the rules of fair play under which American private investment can enter these countries.

The most startling example of how unforeseen events can alter the entire foreign trade picture is, of course, the crisis in Korea. As a matter of fact, there is considerable reason to believe that the Korean invasion was inspired partly because of the very progress in Europe under ECA that we have been discussing. Whether or not it was brought about in retaliation for our success in the West, the Korean invasion has helped to throw an entirely new light on the prospects of foreign trade, brought about by a change in the world's dollar supply. The United States took a sudden interest in the stockpiling of strategic materials, as well as in its supply of nearly all basic commodities. Dollars began pouring into the coffers of the sterling countries, with their financial center in Britain, for wool from Australia, rubber from Malaya, jute from Pakistan, cocoa from British West Africa, and diamonds from South Africa. Equally important for dollar balances were the soaring prices for these materials; the sterling price for wool doubled, and other prices increased 50 per cent or more.

In August, U. S. imports reached their highest level in history, and for the first time in thirteen years their total

(*Continued on page* 34)

A 53-ton electrical transformer arrives in France under ECA.

Let's Put Our Plans On Wings

By R. E. Allen, P. E.,

Immediate Past President, Ohio SPE

RECENTLY I made a trip to Corning, New York, situated in the hilly portion of the state not far from the Pennsylvania border. In journeying there by train you wind among the hills through beautiful valleys. You are conscious always of the hills, however, and your view, your horizon is limited by them. As you gaze at them you find yourself wondering what is beyond the next hill and the one after it.

On my return trip I flew, and I was amazed to find, that as soon as the plane had cleared the airport and gained a little altitude, how small the hills had suddenly become. I was able to see for miles in all directions, and from my new vantage point the hills suddenly became insigificant.

I was asked to discuss with you today the problems of our Ohio Society, but I much prefer to view the vast horizons of opportunity. Conditions in the world today have brought home to all people the dependence they are placing on scientists and engineers for future security and protection. We have the opportunity to assume a place of leadership such as we have never had before.

Problems are like the hills. If we look at them from the valley they seem almost unsurmountable, and we feel that if we solve one, we shall only have to face another, and still another. Therefore, I ask you to join me in giving wings to our thoughts, and from this new vantage point, let us sweep the broad horizons of opportunity. With our thinking pitched on this high plane, the problems of O.S.P.E. shrink to a size that should make it easy for us to see them in their true perspective.

IF I were to ask you for your opinions as to the thing most necessary for the continuation of our democratic way of life, I am sure that I would get many different answers. We all recognize the crisis that our American political and economic system faces at this time. What is the one thing most desperately needed—just as it has been needed in all other times of crisis. The answer is leadership. Our country needs the leadership of thousands of loyal, sincere, unselfish, and above all, qualified American citizens. If we don't have this leadership, what are we going to do to alter the condition? Let us view the situation within our own profession. Our engineering colleges and universities are doing their best to turn out young men and women adequately trained to cope with today's technical problems. What is being done to train them further to fit into the broader scheme of life in our American communities? To me, here lies the great opportunity for O.S.P.E. Let us accept the challenge of a great cause and become the training ground for leaders—not only for our profession, but for our communities, state and country.

Let us develop a broad program of leadership training and integrate it with the programs of our chapters and with chapter activities. With the proper type of publicity, this should attract new men to our organization and inspire those who are already members.

IF we are to successfully tackle a broad program of this kind, there are a few things that we need to do to put our house in order, so that we will not be harassed with some of the minor, irritating problems that seem to occupy so much of our time and attention. So that we can consider them in their proper light, let us group these problems.

There is the administrative problem of perennial officers. This is a touchy problem—a large hill as viewed from the valley. But, remember that today we are looking at these hills from above. All of us realize the value of continuity, but I believe there is far greater danger in the situation where an officer keeps succeeding himself. If a tree did not shed its old leaves in the fall, where would there be room for new ones in the spring? How can we expect to develop leadership in our Society, if we do not give new men the opportunity to serve and to demonstrate their qualifications? Think of the tremendous impetus that would be given to our Ohio Society if every member all over the state had served a term on the Board of Trustees. This is impossible, but many more men could have this experience if chapters had a policy of continually changing trustees at the end of one year's service. If more continuity is required, let the man serve one year as alternate trustee, and then one year as trustee.

There are financial problems. Those of you who have seriously studied the monthly budgets and treasurer's reports must realize that we are attempting to operate a program of considerable magnitude. Inflation has made itself felt in our cost of doing business. By practicing rigid economy and curtailing certain phases of our program, we have managed to live within our income. We are hamstringing the growth of our Society by such a policy, however. Is there anyone here who would object to a yearly increase of $1.00 in O.S.P.E. dues? In the light of the program that we are discussing here, this seems little enough.

We are also losing considerable financial revenue from delinquent members. We are convinced that much of this stems from the lack of activity on the part of chapter secretaries or treasurers in sending out statements. These statements could be sent out by the O.S.P.E. office, but it would cost money. We have been faced with this problem for several years now, and it is high time that we did something to solve it.

Next there is the problem of society growth. It must be sold by personal contact. If it were possible to sell everything by direct mail, millions of salesmen would be out of work tomorrow. In our organization, every member must be a salesman. Our effort to provide him with a uniform plan and kit of material has not met with universal success. Many chapters prefer to continue their own individual methods, and some of them continue to use methods that have not produced results in the past.

Something new and dynamic is needed in our society activity to attract and hold the interest of men who are potential leaders. Their imaginations will not be captured by dull and uninteresting programs that do not challenge their minds. Let us plan a bold new series of programs with leadership as the central theme and then provide the place for practice and experience through our committee activities. Bring the younger members in and give them assignments to carry out. Train them for chapter leadership and see also that they have opportunities for service outside our society. Don't forget that dozens of technical societies need good leadership.

Beyond all this, managements are constantly combing the ranks of their organizations for men who can accept leadership—responsibility. Engineers who have a solid technical background combined with executive ability and training need have little fear for their economic future.

—Engineer Allen's talk was given recently before a meeting of the Ohio SPE.—Editor.

From Terms To Repeat Packages . . .

The Profession–What It Is And What It Needs

By Pilson W. Kelly, P. E.,
Member, New York SSPE and NSPE

It seems quite evident that it is mechanically impossible to decide whether engineering is a profession without having a respectable definition of the word "profession," yet the production of such a definition has been studiously ignored. It appears that the reason for this is that men seek a definition by analysis, analyzing dictionary definitions, and quotations of prominent men, and they do these things without success.

Now, it has been the experience of the writer, over many years, that synthesis, the construction of a desired result, piece by piece, has so many advantages over analysis, that he instinctively turns to synthesis first, in solving problems.

The purpose of this article is to propose a definition for the word "profession," and to show that engineering could not only be made indisputably a profession, but also could be made a much more glorious one than it now is to most engineers.

You are entitled to a word of explanation as to why it is dared to formulate a definition of this kind. Briefly, the greater part of courage is the courage of having done a thing before, and this is not my first offense. The vortex was entered quite innocently, and started with the word "philosophy." Dictionaries were worse than useless because before consulting them, the meaning of philosophy was my only trouble. After consulting them, in addition to not finding out what the word meant, there were six other things not clear about it.

Interrogating some good philosophers didn't move much swifter. They fell into two groups, those who believe that philosophy was the love of wisdom, but who couldn't say what wisdom was; and those who claimed that philosophy was so broad that it couldn't be defined at all. This latter defect, of course, would carry the inescapable consequence that the thing couldn't possibly be worth two cents.

Synthesis, however, worked like enchantment. It occurred to me that possibly philosophy was simply "the study of the reasons for things." This was presented to some recognized philosophers, and to my surprise, every one of them approached, accepted this definition cordially.

Since that time, synthesis has been applied in print to such troublesome words as "intelligence," "value," "cost" and "capital." Intelligence was defined as "the ability to detect sameness and differences, and to associate cause and effect." Value was defined as "the degree of intensity of wealth." There was a repercussion to this, for a savant wrote me that he still didn't know what value was, which required an article in "Technical Valuation" showing that wealth was easily identified by its usefulness, that intensity pervades a thinker's every thought, and that putting the two together presents no obstacle. It was pointed out that the trouble is not that men do not know what value is, from the definition; the trouble is that they do not know how to measure value perfectly in all cases, or even very well chiefly because they never tried very hard to learn, which is a different problem entirely.

Recently, a proof was offered in Dun's Review that the universally accepted definition of "cost," the number of dollars spent for a thing, without regard to the quality of the "dollars," is absurd, because it puts its practitioner in the position of trying to measure things without a standard, and that's enough to make the cat smile in an engineering office.

So, without posing as an authority on this definition business, but rather as one who has labored in the vineyard and been able to duck at the right times, permit me to offer this definition of a profession:

"A profession is a method of earning a living in which this product is sound, independent advice."

Of course, an important thing about "rolling your own" definitions is that they have no integrity whatever until many able men agree with them, after every opportunity to tear them to tatters. You are invited to test this definition for integrity.

It may seem surprising that some of the usual elements are missing, notably:

Ministering to the people
Mental versus manual labor
Long education and training
Code of ethics
Prohibition of advertising and soliciting

There is evidence that these are not basic, necessary elements, but rather auxiliaries to sound independent advice, and some of them are connected very casually indeed.

Take ministering to the people, for example. Naturally, unless you practice a thing for yourself as a hobby, you must use it for other people.

Then, there is the Mental versus Manual requirement. A profession must be mental rather than manual, simply because advice is a mental, rather than a manual process.

Then, there is the matter of long education and training. This operates entirely to the end that the advice may be sound, sounder than one could get over the back fence or at the nearest saloon, where there is plenty of advice.

Codes of ethics and prohibitions on advertising and soliciting exist entirely to support soundness and independence of advice. After all, if one is going to be independent, and talk to the client like a Dutch uncle for the client's own good, he must use some means to preserve the fiction that he doesn't need the business.

In passing, some of these codes of ethics have some corkers in them. For example, if the representative of a big practitioner solicits on the deck of a steam yacht, that's "an interview warranted by existing personal relations." If a little fellow does it, its "cadging for clients."

Then there's the matter of commissions paid for work. The prohibition in some codes is against payments to the *laity*. Payments to another practitioner are all right. But if buying your way is wrong, does it make any real difference from whom you buy it?

Engineering appeals to youth. Here West Virginia University students inspect tainter gate for dam.

A word about independence. This does not mean that a practitioner shall be a law unto himself, for the clergyman is held by the tenets of his faith, the lawyer by the law, the accountant by accepted accounting principles and so on. Independence means that the practitioner must be in such position that he can decide things strictly on their merits, in accordance with his science, without fear or favor. When a man is an employee, it is difficult and often impossible to do this, for there's a job and a pension to protect, and a boss to please. The legal relationship is master and servant and the idea of an independent servant is absurd.

Only a few consulting engineers remain in independent practice and over 99 engineers in 100 are employees of corporations, and the reasons for this are very interesting and will be outlined later. The simple truth is that most engineers are not practicing a profession, as defined.

Now there are two ways of looking at this. There are worse things than not practicing a profession, for practicing a profession is not all beer and skittles. It is very difficult to build a practice and in some professions, good authorities claim it is impossible. The big fellows have gobbled up everything that is any good, and it's a hard life, with not even social security or old age benefits. The engineer has only done on a small scale what all mankind has done on a large scale, that is, traded most of this liberty and independence for a little greater security. That's what civilization is, the trading of most of man's independence for police, fire, sanitary security and the like. If the engineer knew what professional practice is like, he would cherish no feelings of inferiority at not practicing a profession.

The other way of looking at it is man does not live by bread alone, and a profession has the flavor, if not the substance, of being a higher calling. And it is galling to a good engineer, who can prove everything he says or does, to have to look up to lawyers who are clearly diametrically wrong exactly half the time on the average, for every case has two lawyers at least, and half of them must of necessity lose.

It is no more pleasant to look up to accountants, whose habitual method of proof is to quote other accountants. No, when it comes to sound advice, the engineer holds the palm, for proof marches on his flanks in solid phalanx. What a pity that the engineer's superb superiority in the matter of sound advice cannot be offset against his clear deficiency in independence.

The problem now becomes entirely a matter of endowing the engineer with enough independence, at least as much as lawyers, doctors or accountants, so that his art may be clearly not only an undisputable profession but a glorious one, and without wholesale abandonment of corporation jobs.

By great good fortune, synthesis produces a way of doing this effectively, and you are requested to carefully observe, that at the same time, it takes under control two problems of engineering which may be many times more important than the question whether engineering is a profession, more specifically, the matter of the great influx of youth, for whom work is hard to find in engineering, and second, the problem of the superannuated engineer. In case you don't know it, men became superannuated at a very early age in that industrial civilization of ours, which is stark, raving mad on the subject of young men. Some prominent engineering firms will not hire a man over 35, and before that time, he is told that he is still gaining experience. A cute but brutal way of keeping payrolls down.

The influx of youth is due largely to the magnetic appeal that the wonders of engineering have for the vivid imagination of youth, with the result that there are some 500,000 graduate engineers, besides many more without degrees, while there are only about 100,000 physicians and 30,000 C.P.A.'s. Perhaps the greatest problems of engineering is to find proper work for its multitude, and for another multitude hammering at the gates.

There are two keys to these three problems:

1. Something promised above, the story of how the engineers lost his liberty in the first place.

2. An interesting quirk of society which results in the fact that as long as a great body of practitioners of an art practices independently, it so endows the remainder with enough independence that all come under the mantle of a true profession.

Turning to the first, the engineer lost his independence simply because he could not think up a repeat package to sell to industry. To stay in professional practice, repeat business is essential. Nothing else will do. The lawyer and

(*Continued on page* 32)

Job Analysis No. 2:

The Professional Engineer In Television

ONE of the newer, more interesting fields to open up recently for engineers is in the television industry. This mushrooming, infant business has present as well as vast potential employment opportunities.

The latent employment openings in the field become apparent when one considers television has developed into the country's first new post-World War II billion-dollar industry. The total television receiver sales for 1949 were estimated at $880,000,000, and the gross dollar volume in the entire field for the year (including transmitters, studio equipment, home antenna installations, servicing, warranties, and accessories) was estimated at $1,013,-250,000. Receiver production by members of the RCA amounted to 2,413,397 units for 1949, and the total output for the entire industry exceeded 2,800,000 as compared with an estimated industry-wide TV receiver production of only 955,000 units in 1948. More than 4,000,000 television receivers have been manufactured and installed in American homes since the close of World War II.

Industry engineers have been hard-put to keep pace with the increasing demand for more improved equipment of all types, whether for TV transmission or reception. The constant demand for more equipment of higher quality and more advanced design has taxed the ingenuity of practicing professional engineers. There has also been a continuing search for practical technical information with which to solve the many engineering problems that have arisen.

The field is one which requires specialization, and unlike radio, the importance of the industry has been recognized at its inception. In the early days of radio, engineering training was a haphazard affair, for what was believed to be a fly-by-night venture at best. Television, on the other hand, can already demand trained personnel and many young men as well as more experienced engineers are realizing the future and scope of this business.

In an effort to ascertain the opportunities, necessary training and background for television engineering, the AMERICAN ENGINEER recently interviewed three Chief Engineers of major TV stations in Washington, D. C. Interviewed were Mr. Charles H. Colledge, Television Technical Operations Supervisor, WNBS-TV, an NBC affiliate; Mr. Clyde M. Hunt, Director of Engineering and Operations, WTOP Inc., a CBS affiliate, and Mr. M. M. Burleson, Chief Engineer, WTTG-TV, a subsidiary of the Dumont Television Network.

The first question asked was, "What are the opportunities for the engineer in television today?" All felt them to be good at present, with even greater employment chances when the F.C.C. lifts its current "freeze" prohibiting the formation of new TV stations and allocates additional frequencies. Mr. Burleson pointed out that advancement in the field of TV engineering depends largely on the ability displayed on-the-job. The various specializations which television affords the engineer were enumerated by Mr. Colledge. They include: research, both for private studios and manufacturers of sets; technical division of the program department, which includes work in video control, audio control, and photography; transmission; master control room supervisor to handle film projectors and picture quality; and service and installation. Colledge further pointed out that three years ago the total engineering personnel of NBC was 100 engineers, whereas now, station WNBN-TV alone employs 50 engineers. The average crew per

show is nine men; seven engineers and 2 technicians.

Job classifications vary from station to station. Some studios require that a cameraman be an engineer as well, while others prefer him simply to have some knowledge of the camera. One station differentiates between technicans and engineers, in that technicians are used for studio work, while engineers are responsible for control room and transmitter work. Another station has three technician classifications: senior technician; Class "A" technician, who handles transmitter work; and Class "B" technician, who is responsible for studio and control room performance.

Required background and experience for the television engineer varies somewhat between the three stations, but has a general pattern. Burleson, for example, said that his station prefers men from the ages of 25 to 35, with experience in electronics. Previous work in broadcasting is helpful, and radio ham experience is extremely beneficial. He feels that a ham operator who keeps up a continuing interest in his hobby after work hours, develops more incentive by associating his hobby with his job. Hunt also listed Armed Forces experience in electronics and good trade school training in radio and television as valuable assets for the professional engineer in television. Mr. Colledge said that his station requires his engineers to have a formal education or the equivalent. He added that higher executive offices in the networks necessarily demanded more and more university training.

All three men interviewed by the AMERICAN ENGINEER felt that the engineer in television was receiving payment commensurate with his abilities, and that salaries in the field were generally superior to those in many other fields of engineering. All three stations have salaries ranging from approximately $65.00 per week for a beginning engineer to $160.00 per week for a supervisor, and there was very little deviation in wage scales between the stations.

The main difficulty in college training for the television engineer is approximately that of early radio training. Straight Electrical Engineering degrees more often than not do not include any television work. Television is a highly specialized field, and requires particular training, which is not received in undergraduate work. As in radio, the trade school, unfortunately, often provides a more thorough background for the field. Many educators are becoming aware of this deficit, however, and are taking necessary steps to correct it, rather than delaying the introduction of a television engineering curriculum into college work, as was the case with radio engineering. The increased recognition of the engineer in the industry as a professional man will, of course, be directly affected by the addition of these courses.

An indication of the recognition of the significance of this new communication medium may be seen in the duties and attitude of the Federal Communications Commission in respect to radio and television. In the early days of radio, the F.C.C. was hastily organized, and their primary concern was the allocation of broadcasting frequencies. Standards for operating equipment were negligible, and any business man could, without any expense, file application for a station license and employ anyone to build the equipment. As a result, radio's first "engineers" were relatively untrained, a factor of little importance to the industry at that time.

In contrast, television is beginning under an altered set of circumstances. An entire book of F.C.C. regulations and specifications has been written to cover all phases of television operation. As these rules practically do away with the building of a composite transmitter, more money must be invested to start out in the television business. Moreover, the installation is a highly skilled process. Trained professional engineers are required to keep this equipment operating in agreement with the standards set up by the F.C.C.

In addition, special Proof of Performance measurements must be taken periodically to demonstrate that the equipment is being properly maintained. Extremely expensive equipment, coupled with rigid engineering requirements, make it necessary for a station to hire the best trained engineers. These engineers will continue to be a more important part of the industry. Television engineering is so technical that trained engineers will be required to coordinate the whole business operation. Therefore, good prospects are offered the engineering graduate who wants to become an executive.

These required tests may open up a new type of television engineering business. A skilled engineer, owning his own testing equipment, can contract to make complete performance checks on various television stations. Working for various studios, he can learn from each individual job, and so become a worthwhile advisor.

Television, then, presents many opportunities for the professional engineer, whether in research, broadcasting, installation, or maintenance. A sound engineering education, coupled with radio or allied engineering experience, qualifies you for the job, and the salaries and advancements are generally sure to echo your ability. Moreover, the present is an ideal time to enter this new and challenging field.

NSPE President Sidney L. Stolte, P.E., opens the Little Rock meeting. Executive Director Paul H. Robbins, P.E., is at the left.

Manpower Statement Highlights Directors' Meet

With President Sidney L. Stolte wielding the gavel for the first time at a general meeting, the Board of Directors, representing 35 State Societies, gathered in Little Rock, Ark., recently, as guests of the Arkansas SPE, to discuss and take action upon scores of items of importance to the Society and the engineering profession. Summaries of these discussions, covering as many items as space will permit, appear below.

A four-point statement suggesting action on mobilizing engineering manpower to be taken by the government during the present emergency, was one of the outstanding policies adopted by the Society's Board of Directors at its meeting. The statement, which is published in full on pages 18 and 19 of this issue, contained four proposals. They are:

1. That a realistic deferment policy be initiated in order to guarantee the future supply of technical personnel throughout an extended mobilization period.

2. That during a period of extended emergency, a review board of eminent engineers and scientists be appointed to maintain a balance between requirements for engineers to meet the military needs and defense production needs.

3. That steps be taken within the armed forces to insure the proper utilization of professional personnel during war-time.

4. That if full mobilization is necessary, steps be taken to assign technical peronnel in civilian services where their greatest contribution toward the defense effort can be made.

Young Engineers

In its report, the Young Engineers Committee stated that "volunteer counselors who will give orientation assistance to engineering students, engineers-in-training, and young professional engineers, would appear to be one way in which professional engineers of established standing could, by correspondence, place their experience and judgment at the disposal of these groups. Such volunteer counselors would not be expected to answer inquiries for jobs, but would be expected to give advice and counsel regarding the direction in which young engineers might progress. A list of about 200 well-established professional engineers who will consent to be recognized as volunteer counselors on orientation problems is now being developed through the Presidents of the member State Societies."

The Committee's report also pointed out that membership of E-I-T's in State Societies, is imperative if the National Society is to fulfill its mission. It was also emphasized that Chapter meetings should be designed to attract E-I-T's and young professional engineers. The Committee, it was stated, is developing suggestions for making Chapter meetings and Annual State Society meetings definitely more attractive to young engineers, and these suggestions will be presented to the Society at a future date.

Legislation

After reporting on legislative activities during the past few months, the legislative committee turned to the need for great flexibility of Society plans to meet anticipated conditions of the future. It was stated that the Committee will endeavor to meet the critical times ahead with two objectives in mind. They are: To provide the fullest aid and support of the engineering profession to the national defense and to enhance and protect the interests of the engineering profession consistent with the first objective.

Engineers' Week

The committee outlined plans for the observance of Engineers' Week during the week of February 18, 1951. It was announced that a kit would soon go out from national headquarters to all Chapter officials. The kit, which will include suggestions on how to promote the week at top local level, will contain such items as radio scripts

proposed publicity releases, instructions on how to secure the cooperation of civic leaders, and so forth. The Committee urged the Board of Directors to encourage Chapter officials in their State Societies to make all possible use of the Kit and to promote Engineers' Week to the greatest possible extent.

Public Relations

Much of the Public Relations Committee report dealt with the Public Relations fund-raising campaign now being conducted. The program to be carried out was reviewed, as was the necessity for increased public relations not only on the national level, but at the State and Chapter levels as well.

American Engineer

The Committee reported new developments in the campaign to socilit advertising for the AMERICAN ENGINEER. It pointed out that the new advertising representative recently appointed in the New York City area, had proposed special issues as a means to securing greater advertising revenue. The special issue would be an outstanding quality magazine including the highest type of editorial and illustrative matter. Plans for such special editinons are now being developed.

Awards Committee

The Awards Committee had several recommendations to place before the Board. They were: 1. The establishment of an NSPE award to an outstanding engineer who had made contributions to the welfare of the profession and to public welfare, to be presented at the Annual Meeting of the NSPE. 2. The preparation of a questionnaire and rules for the selection of the engineer, to be sent to the State Societies for their recommendations. 3. The selection of the award to be presented. 4. Suitable recognition of each NSPE president upon expiration of his term of office. 5. Exploration of possible awards for other NSPE Officers, Directors, and Committee Chairmen. 6. Recognition to NSPE engineers who have contributed to the advancement of the profession through non-technical activities.

Salary and Fees Schedule

The report of this committee stated that the next step in following the interim report recently released on Salary Studies, should be the development of the appropriate set of grades in professional and pre-professional classes. Coincident with these considerations, it was stated, should be a development of these responsibilities, qualifications, education, experience commensurate with the work in these grades. Upon the establishment of this information the question of appropriate salary recommendations would be studied. On the subject of Fees, it was announced that the Committee given responsibility for these considerations had been asked to proceed with their studies with the expectation that the information developed with the Fee studies will be correlated at a later date with those in the Salary structure.

Chapter Activities Committee

The Committee announced that it feels it is mandatory that they obtain answers to the following vital questions: 1. How is our Chapter manual being received and utilized? 2. What can be done to make this manual more effective? 3. What are the most outstanding Chapter activities? 4. What do Chapter officers believe that the Committee should do to help them?

A questionnaire including the above questions has been prepared and it is hoped that it will soon be mailed to all Chapter Presidents and Secretaries.

Extension

The Extension Committee indicated that a general survey showed that NSPE is receiving favorable consideration in Wyoming, New Hampshire, Oregon, Delaware and Louisiana. The states of Alabama, Utah, South Dakota, Iowa and Montana are interested but there is still considerable promotion work to be done. Other states requiring a great deal of work and in which the status of affiliation with NSPE has not definitely been determined are Kentucky, Vermont, Maine, Mississippi and Nebraska.

Ethical Practices

The Committee pointed out that work already done on such subjects as free engineering, advertising by engineers, and rules for ethical conduct is being used as a springboard for further exploration and research of these highly controversial items. In order to spread the implied work on these three subjects, it was pointed out, and to pinpoint a certain amount of responsibility, the Ethical Practices Committee has been divided into three "task forces," each of which is charged with the development and exploration of one of these subjects. It was also stated that the matter of a Creed for professional engineers was being given consideration. Further work would also be done by the Committee regarding ethical practices as they may apply to the employed engineer.

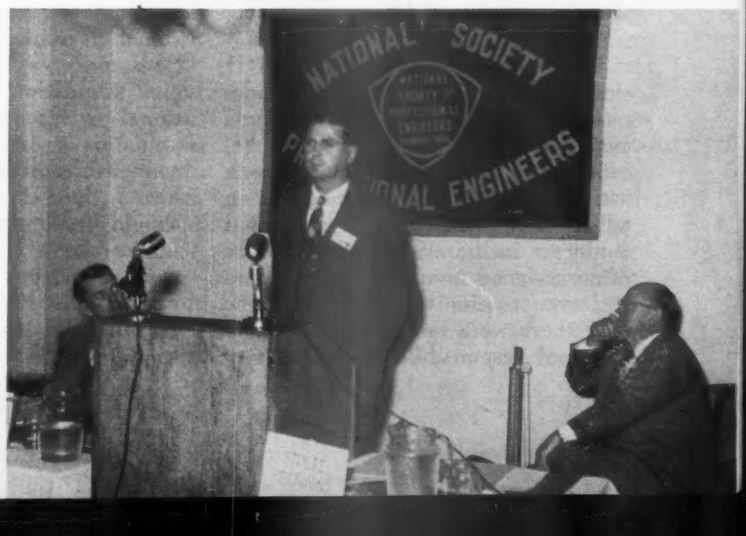
Active Social Program

The meeting, under the auspices of the Arkansas Society, was as successful socially as it was professionally. On November 3, the visiting directors were feted at a luncheon in the Hotel Marion featuring an inspiring address by Tom Mull, Director of Education, Arkansas Fish and Game Commission.

At a cocktail party and dinner in the evening, the engineers were addressed by Charles Evans, Assistant to the President, Arkansas Power and Light Co. Evans reviewed America's political and economic scene and called for professional engineers to be generous with their talents in making the country's future as great as its past.

The Society's Executive Committee met in Little Rock the day preceeding the Board Meeting to review the well-filled agenda for the two-day affair.

J. D. Waddell, P.E., Secretary of the Delaware Society, addresses the group.



The Engineering Profession In National Security

—A Statement Issued By The National Society of Professional Engineers—

THE total welfare and security of the United States and not the best interests of any group or of any individual is the basic consideration for all questions to be resolved in this policy statement of the National Society of Professional Engineers.

General Policy

The objective of the engineering profession in time of international stress must be the development of the means to provide a maximum contribution to the military strength of the nation and the maximum production to support that military strength.

In the military service it is necessary that the best talent be available to manage and direct the many engineering problems of a modern army. Likewise those charged with military engineering responsibility must be professionally qualified. No nation is so abundant in technical and professional talent that it can afford to waste the use of such technical skill and professional abilities in capacities below the maximum level at which such skills and talents can serve.

In the production effort which must support the military service it is necessary that the best and the most in modern weapons and material must be made available to the armed services and at the same time provide a sound base for the civilian economy. This task will require a continuous flow of engineers for training and for obtaining experience to meet the requirements not only of the normal attrition, if the depletion of the technical personnel during an extended period of full or partial military mobilization is to be prevented, but also for the increasing of a rapidly expanding technological economy.

These objectives must be achieved if the most is to be made of our available engineering resources.

Engineers in Military Service

The experiences in World War II clearly demonstrated a failure to adequately use the professional talents available in the armed services because adequate preparation for such use was not made sufficiently far in advance. Many qualified professional engineers in the armed services were often assigned nonprofessional duties and even routine tasks. At the same time there were instances where professional responsibilities were thrust upon unqualified individuals. Every effort should and must be made to prevent such waste in future military mobilizations.

The primary responsibility for resolving the problems involved must rest with the personnel classification system of the armed services. Therefore, it appears essential that the armed services establish policy boards or review boards or both. These should be composed of professionally qualified officers of high rank who would be given adequate authority to establish policies, to investigate or cause to be investigated the apparent misuse of professional personnel, to recommend transfers of such professional personnel to appropriate professional assignments, to recommend transfers of non-qualified personnel from assignments requiring professional qualifications and to perform such other duties as the armed services may feel will enhance the basic policy of the most effective utilization of the professional personnel in the armed services.

Mobilization of Professional Talent in Civilian Services

IT is a basic requirement that the factories, the plants and the research organizations devoting their primary effort to military production must have first call upon the best available professional talent and technical skill. During maximum military mobilization there will soon develop a shortage of technically qualified personnel in certain fields. Those who are best qualified to serve the national defense material production must not be allowed to be used for the less essential production of goods or the furnishing of services or the continuation of research for the needs of the civilian population.

In the past it has not been necessary to establish any procedure for the involuntary assignment of professional personnel in civilian occupations concerned with the needs of the civil population. Past periods of national emergency have relied upon voluntary means to place the best personnel in the essential jobs. It is believed that the voluntary program should be continued until and unless future events begin to develop such acute shortages of technically competent individuals in the national defense production program. At such a time it may conceivably be necessary to impose some form of control by the Federal Government over the assignment of technical personnel to specific tasks. Unless and until such control proves necessary, the engineering profession should cooperate to resolve the issues through its voluntary organizations. The personnel needs of industry which supplies the military should prevail except in time of real necessity.

Any system for the allocation of professional personnel in technical work must rest upon the broad knowledge and detailed appreciation of the individuals having the desired talents, and the detailed knowledge of their individual experience, individual abilities and individual capabilities. The rosters of scientific personnel and of professional personnel used in World War II should be brought up to date, kept up to date and improved immediately. The engineering profession and all other scientific professions should do everything possible to support the Federal Government's effort to develop and maintain an adequate and improved roster of the profession.

Basic research must be maintained in an appropriate proportion at all times, as it is the foundation upon which development of national strength depends.

Balancing Military Needs Against Defense Production Needs

IT is axiomatic that the armed forces cannot accomplish their mission without personnel.

The decision to induct or not to induct an individual into the armed forces should rest on the answer to only one question. It is, in which location will the individual in question provide the most useful service to the total national defense effort?

The decision should be made on this basis and not on the basis of the desire of the individual or the inconvenience to the individual or others.

It is realized that few cases will be clearly defined and it is, therefore, necessary to establish appropriate procedures for making these decisions.

It appears desirable that the appropriate agencies of the Federal Government establish a national review authority to consider applications for deferment from military service on the basis of employment in civilian research or civilian production having a direct relationship to the national defense effort. The questions arising

NSPE Launches Public Relations Fund Drive

C. G. Roush, Chairman of the NSPE Public Relations Committee, has announced that the initial mailing to members explaining the necessity of the public relations fund raising campaign and soliciting their support, has been distributed.

Monies raised through the drive will be used to carry out a 4-point program designed to gain greater professional recognition for professional engineers, and to increase the Society's service to its members. The four points are:

1. Tell employers of the asset they have in the registered, professional engineer.
2. Sell industry and other users on the value of employing the consulting professional engineers engaged in private practice.
3. To urge educators to instill professional concepts and the values of registration in students.
4. Tell the general public about professional engineers.

In announcing the opening of the fund raising drive, Chairman Roush emphasized that much of the program when begun, will be carried out at the local chapter level. Chapter and state officials, it was pointed out, will play a major role in preparing mailing pieces, publicity releases, articles, and other material to be used in getting the professional engineers' story across to the proper people. Mailing lists will be prepared by the chapters in order that those nearest to and best informed about local conditions will determine to whom informative material should be sent.

As the campaign proceeds, National Headquarters will, through the pages of the AMERICAN ENGINEER, published the comparative standings of chapters throughout the nation. Records, of course, will be kept by number participating, not by amounts given.

Chapter officials were again urged to use the Fund Raising Kit sent them from National Headquarters, and to use all available means to maintain interest throughout the drive.

Members who contribute five-dollars or more to the Fund will receive the metal Professional Engineers Plaque suitable for attachment on an automobile. Additional material about the campaign and the plaque, will be found on page 29 of this issue.

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under these conditions cannot be satisfactorily resolved by local selective service boards under the present Selective Service Act of 1948, as amended, because of the lack of acquaintance with technological needs by the personnel of the individual Selective Service Boards. Therefore, Review Boards at county (or regional), state and national levels should be established. In a long term emergency, delay of induction occasioned by the necessity of such review is preferable to hasty decision which may be detrimental to the national welfare. The proposed Review Boards should be composed of outstanding and eminent engineers and scientists and others having a detailed knowledge of the technical problems involved, an understanding of the situation and broad experience in industrial research and industrial production.

Applications to the review board for deferment from military service should originate from employers and from others bearing a similar relationship to the individual for whom deferment is being requested.

Future Supply of Technical Personnel in Extended Mobilization Periods

THE resources of technically skilled personnel in the United States came dangerously close to depletion during World War II. This resulted from the requirement of a five-year interval necessary to educate and train and graduate students in technical curricula and to give them some experience. The shortage of graduates in engineering curricula and in science curricula has not yet been overcome, and there is today a definite shortage of trained engineers. Thus, even before wide-spread mobilization is in progress, the policies pursued during World War II are already being felt. It is not possible to meet the present limited emergency with the presently available professional personnel skilled in engineering and in science. Deferment policies now in effect mitigate against every objective outlined above.

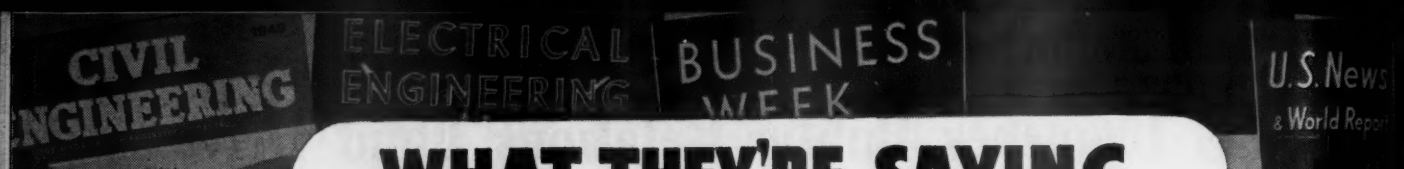
Leading authorities caution us to look forward to a generation, that is about 30 years of stress and strain in international relations, subject at any moment to an outburst into total war. Under such conditions it is imperative that plans be made for a continuous and sustained flow of trained engineers and trained scientists from colleges and schools and universities.

The outstanding problem presented by this situation is the realization that these same individuals are in the age brackets considered most suited for service in the armed forces. So, a suitable balance must be developed and maintained between these two requirements of present day conditions.

A careful study of this important phase of the situation should be made by the appropriate Federal Government agencies in consultation with representatives of engineering organizations, scientific organizations and the educators concerned with the imparting of knowledge to students pursuing these curricula. It is recognized that it will be necessary to resolve many details for an adequate policy to be developed in this field, but, on a broad basis, it is believed that a suitable start may be made by recognizing that a maximum number of engineering and science students must be allowed to complete their formal education. It is also believed that upon graduation a reasonable time should be allowed for acquiring the necessary experience to appropriately utilize the education acquired.

The number of students, graduate and undergraduate, permitted to continue their education on the basis of the reasoning just given should not be determined on an agreed percentage of the number of such students and graduates enrolled, but on actual determinations of requirements established by an appropriate manpower mobilization organization composed of Federal government agency representatives and representatives of engineering organizations, science organizations, engineering schools and science schools.

The National Technological requirements should be reviewed at intervals and the aptitude and scholastic standards required to continued study should be adjusted accordingly. It is recommended that planning toward the establishment of national achievement tests in professional specialities be expedited to promote uniform standards.



WHAT THEY'RE SAYING

THE ENGINEER'S STAKE IN PUBLIC RELATIONS . . .

Compared to the struggles of other professions for favorable public recognition, engineering is twice blessed. Both its origin and its recent past have bequeathed it a favorable, though not prominent, public standing. In the minds of people who understand the creed, philosophy, and contributions of engineering, the collective image of the profession is a positive one of objective research, constructive effort and a service to mankind.

Some other professions are haunted by dark symbols created in the past. Doctors shudder at the word "quack." "Shyster" gives the legal profession a chill. The study of word meanings is full of such labels which, through usage, association, and deliberate twisting have become derogatory symbols. Among the leading professions, engineering alone has not been successfully labeled with a negative symbol.

The significance of "symbols," i.e., words, sounds, and marks which stand for something else, was first determined by the Nobel Prize winner, Ivan Petrovich Pavlov. Pavlov's discoveries emerged from his experiments which formulated the theory of conditioned reflexes. A conditioned reflex was established in that a specific response followed promptly upon a sensory stimulus which had previously produced no such result.

Applied to humans and simply stated, this means that people are responsive to repeated physiological stimuli, and — more importantly — mental stimuli. The effects of repeated mental stimuli are familiar to all of us. We often hear clangorous radio advertising, accompanied by such insistently repetitive theme songs, catchwords, or just noise, that we learn about the advertised product in spite of making no conscious effort to learn, or even while making a deliberate effort to ignore it.

In essence, what we repeatedly see, hear, read, or experience about specific subjects establishes symbols in our minds for those subjects. Our feelings and expressions on these subjects are automatically released when the symbol is presented.

Symbols—such as names or insignia —may be either good or bad. They will vary with the audience and may change character from generation to generation.

Good symbols do not come into being by happenstance. If mention of a firm, product, institution or profession evokes favorable comment from a large number of people, then the symbol of the subject has become respected through repeated friendly associations.

In spite of the generally favorable standing of engineering, there is evidence that the profession is not fully understood and appreciated by the general public. If you were to take a poll of passers-by on the street, asking each of them to name a great engineer, chances are they would scarcely be able to name one. Yet, most of these people could unhesitatingly name a great general, or a great statesman.

This indifference on the part of the public to the significant achievements of engineers is sometimes attributed to the technical nature of the profession. But in view of the performance of other professions, this argument is not valid.

Scientists, working in the purely abstract realm, have done a superb job of dramatizing their profession. Their stories are told and retold, their counsel is sought, and their advice is very frequently accepted. They very fact of their recognition should dispel the idea that the public is not interested in technical subjects. What the scientists have done is to strip abstract and mathematical subjects of their technical embroidery and explain them in terms of human interest and public benefit. They have recognized their responsibility to the public to interpret their work in terms of what it means to the advancement of human knowledge. Engineers could do the same thing quite as capably and establish a greatly improved symbol.

The present public understanding of the engineering profession is one of the first factors to consider in planning to improve public understanding.

Look at the national picture of the engineer fostered by Hollywood. The movies usually show an engineering hero in riding boots, peering through a transit and waving for a building or a bridge to be moved over a little.

Advertising portrayals of the engineer have, in general, been more factual and complimentary. However, there have been some awful bobbles due to inadequate research or failure to check on technical details.

At the community level there is widespread misunderstanding of an engineer's function, whatever his field. The lay public is not interested in, and will not remember, unusual technical titles. They will have to be told what engineers do to appreciate their place in the scheme of things.

Also in the community there appears to be an insufficient proportion of engineers who take the lead in civic projects, organize worth-while activities, or speak before important civic groups. Companies, schools, local and national engineering societies and lay groups frequently find it difficult to get eminently qualified engineers to write interesting papers and present them effectively.

Students of engineering schools periodically follow "fads" for certain branches of engineering which threaten the college with overstaffing in one field and shortages in others. If there is disillusionment or displacement of engineers, or the profession loses its allure for capable young men, its future growth and standing are imperiled.

To meet the problems facing their profession, engineers can undertake a program within the scope of their present activities by applying well-known public-relations principles. The profession is fortunate in having the organization and machinery to conduct a successful program for greater public recognition and appreciation. The national societies, with their experienced headquarters staffs and their network of chapters, form the ready-made organization. The machinery is provided by the general-circulation engineering publications, national, regional, and local-meetings programs

and flow of paper presentations. What is needed additionally is a representative expression by members that they recognize their stake in public relations and want to do something about it.

Engineers who become successful in dealing with people, through participation in public affairs, are better able to put across engineering ideas and changes, develop personal prestige, and advance to greater engineering responsibility.

Within companies, engineers can extend great co-operation to their advertising, sales, and public-relations departments.

If the engineering profession ever decides to follow a plotted course of improving its public relations, it will again be twice blessed: Because it has done tremendous good and promises to do very much more, and because it is not a pressure group, and the only axe it has to grind is that it wants to be known for the good work it has done and is doing.—*By John D. Waugh, Prepared for the Fall Meeting, September, 1950, of the American Society of Mechanical Engineers.*

DEFENSE IS MEN . . .

Combat machines, ships, planes, scientific instruments, and better weapons than those of the enemy are the essential tools of war. What we sometimes forget is that every one of these tools is the result of applied brains and brawn.

The Air Corps, the Navy, and the Army are, above all else, organizations of persons, not airplanes, ships and tanks. Lately we have badly twisted our sights in the process of raising them. There is a school of thought that believes defense is essentially the procurement of planes, submarines, and other scientific weapons. Another school insists that the answer is man power. The latter school, however, thinks in terms of numbers rather than in terms of quality or, when the quality of man power is discussed, too frequently dwells exclusively on the physical attributes of the volunteer or conscript.

Both these views ignore the mental attitude of the soldier, sailor, nocom, and officer and their ability to work with others as enthusiastic parts of an effective team. They erroneously take for granted that, given modern weapons, and men in quantity, good management will automatically come into being. Our country has given a generation of specialized thought to the question of modern management, but when it comes to the defense of our Nation, it seems to have learned very little.

Can we produce good military management under the banner of the individual conscript? In emergencies and crises it is granted that emergency methods have a place. But right now we are trying to develop both a short-term and a long-term defense. Have we really thought this through? We might as well admit that we face twenty-five years of preparedness—perhaps more. This demands a highly skilled, well-directed force on the sea, ready for instantaneous action twenty-four hours every day — Saturdays and Sundays included (remember Pearl Harbor?)

Our technician of today cannot be recruited overnight, and he cannot be developed into a useful combat man without months and usually years of intense training followed by years of refresher training and constant modernization. To develop such fighting men we must apply principles and methods that have proved themselves in American business.

The first of these, the very foundation, is that each human being must possess and develop dignity. No really informed, cooperative *esprit de corps* can come from compulsion. Discipline is necessary, of course, especially for the negligible recalcitrant minority.

Well-managed organizations in and out of business have come to see that men work best when encouraged through proper executive environment. The expression of this new policy, so necessary to the technological military organization of the present, and future, will take many forms. First, there is the already-recognized need for the more complete merger of the services. Secondly, there is the diminishing influence of what is called the "trade school"—to be more specific, the class-conscious graduates of Annapolis and West Point. (These schools might become postgraduate colleges for all ranks in the services.)

Thirdly, the elimination of the outward insignia of rank should be considered, except in a simplified form wherein commissioned officers, from second lieutenant to admiral and general, would wear one star and noncommissioned personnel, a star of different color. These men would, of course, have their present rank and authority, but their titles would not be emblazoned on their lapels or shoulder straps.

The whole approach would be based on the theory that military service would be made attractive, not only from the standpoint of pay and such material aspects as better living quarters and a greater opportunity for further education, but also for self-expression, advancement, and the pursuit of happiness in one's job.

Yes, defense is men — masses of men, not men *en masse*. To win wars, these men must be free men. Given good weapons, victory will depend more on the principle of freedom and good management than on any other factor. We can never forget that the next war will be fought in our own back yard as well as on the intermediate and distant fronts. We must translate total war and total defense into an operative technique that not only defends freedom but develops it.

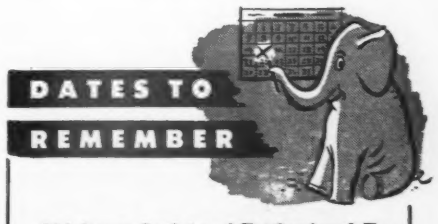
It is hard for some of us to believe that we may have to fight for our freedom all over again, but that is the meaning of world events. Incentive takes many forms and patterns: patriotism; the will to serve; self-expression; fair, honest, intelligent management; good pay; and pride. These cannot be developed through force.—*Robert Wood Johnson, Brig. Gen., A.U.S., Ret., Ordnance, November-December*, 1948.

THE ENGINEER AND THE ATOMIC AGE . . .

Protective construction may be broken into three phases — site planning, design of new structures and modification of existing construction. Location is of primary importance. As has been seen in earlier discussions, properly designed structures will withstand bomb blast from relatively short distances. Therefore, the spreading out of vital installations is of great importance.

New construction affords the best opportunity for designing to withstand atomic blasts at minimum costs. By choice of materials and methods, the

(*Continued on page* 33)



Oklahoma Society of Professional Engineers—Jan. 12 and 13. Biltmore Hotel, Oklahoma City.

California Society of Professional Engineers—Jan. 19 and 20. San Francisco.

Texas Society of Professional Engineers—Annual Meeting, Jan. 25, 26 and 27. Baker Hotel, Mineral Wells.

Illinois Society of Professional Engineers—66th Annual Meeting, Feb. 1, 2 and 3. Champaign-Urbana.

Michigan Society of Professional Engineers—Annual Meeting, Feb. 2 and 3. Wardell-Sheraton Hotel. Detroit.

Accent on Activity

ALLEN CRAIG, Chairman, Engineers' Week Committee, announces that **SPECIAL ENGINEERS' WEEK PROMOTION KIT** will soon go out from Washington National Headquarters to all States and Chapters. Kit contains much professionally prepared material to help chapters promote the Week at local level. **Some of material in kit: COMPLETE RADIO SCRIPT, NEWSPAPER STORIES, SUGGESTIONS FOR WINDOW DISPLAYS, OUTLINES FOR SPEECHES, AND SO ON. REMEMBER:** Engineers' Week, as sponsored by NSPE, is the week of **FEBRUARY 18-24.** This is the week of WASHINGTON'S BIRTHDAY — our great soldier, statesman, AND ENGINEER. EVERY MEMBER SHOULD HELP MAKE ENGINEERS' WEEK A SUCCESS.

PUBLIC RELATIONS FUND DRIVE IS UNDERWAY (See Page 29). Contributions are already rolling in from NSPE members. PR Committee Chairman C. G. Roush urges all members to send in contributions without delay. Roush stresses point that **EVERY MEMBER** must contribute if this first big Public Relations activity is to succeed.

COMMENTS ON THE 1949-50 ANNUAL REPORT RECENTLY DISTRIBUTED are now coming into Headquarters . . . Comments show that report is being READ and ENJOYED. If you haven't read your copy do it now and then pass it along to a **PROSPECTIVE MEMBER TO SHOW HIM WHAT NSPE IS DOING.** BY THE WAY, let Headquarters know what you think of the report—good or bad.

THE NSPE BOARD OF DIRECTORS, during its recent meet in Little Rock, approved STATEMENT ON MANPOWER. Read complete text of statement on pages 18-19 this issue. **THEN, IF YOU WANT EXTRA COPIES FOR YOUR USE, WRITE HEADQUARTERS . . .** Statement already has been distributed to National Security Resources Board, Selective Service, Office of Education, Armed Services, and so on. Statement also distributed to Nation's press and radio.

WE'RE GROWING AND FAST . . . Last count puts NSPE over 24,000 mark!

MEMBERSHIP CARDS HAVE BEEN DISTRIBUTED . . . YOU WILL RECEIVE YOURS THROUGH STATE OR CHAPTER . . . The earlier you pay your dues, the earlier you get your card.

ENGINEERING EDUCATORS FROM ACROSS NATION met in Washington to talk over such priority problems as defering engineering students, ways and means of dealing with present shortages of engineers, and so on . . . Attending confab were such active NSPE members as **Dean Curtis L. Wilson,** Missouri School of Mines and Head, NSPE Education Committee, and National Director from Georgia, **Ray L. Sweigert,** Georgia Tech.

PRESIDENT STOLTE ON THE ROAD: NSPE's Number One Man has recently attended North Dakota Society Meet; Annual Meeting of ASME, and Pennsylvania's Regional Conference at Pittsburgh. Also journeyed to NYC to confer with George Nicastro, Publications Committee head, and Advertising Rep. Warren T. Mayers on American Engineer advertising program.

RECENT PUBLIC RELATIONS NEWS LETTER (a monthly sheet going to chapters suggesting PR activity) contained proposed release to newspapers on Civil Defense. Prizes of outstanding books were offered to those groups sending best newspaper clippings on story to National Hqs. **WE ARE PLEASED TO GIVE THESE WIDE-AWAKE WINNERS MORE PUBLICITY HERE:**

FIRST PRIZES: Upper East Tennessee Chapter, TSPE; North Shore Chapter, Mass, SPE . . . **HONORABLE MENTIONS:** Duquesne Chapter, Illinois SPE; Miami Chapter, Florida SPE; Western Chapter, Wisconsin SPE; and Minneapolis Chapter, Minnesota SPE.

TO THE *Editor* . . .

Paging E. Post . . .

Dear Editor:

Do you think that the practice of dropping the *Mr.* and inserting *Engineer* when writing business letters to Engineers would be a good idea?

Illustration:

Engr. John Doe
Doe Construction Company
Doe City, Iowa

I feel this procedure in addressing both personal and business letters to Engineers would eventually "catch on" with the general public and would in turn indicate a more professional status for Engineers.

ROBERT H. MCINTIRE, P.E.,
Houston, Texas

▶ The NSPE Board of Directors has suggested the following form and its use is urged in the interest of uniformity:

John J. Doe, P.E.,
Doe Construction Co.,
Doe City, Iowa
Dear Mr. Doe:

How About Teachers? . . .

Dear Editor:

The Editorial in the November issue of THE AMERICAN ENGINEER was both very timely and revealing but failed to mention one serious deficiency in the plans now being contemplated for the training of engineers.

General Hershey's plan to defer and train young men from all walks of life who are able to profit by a college education is indeed a noteworthy advancement. No mention is made, however, of keeping the collegiate Faculties intact to accomplish this task. The Armed Forces are already calling Reserved Officers on Engineering Faculties to active duty and if this continues, a sizeable proportion of these collegiate staffs will have to be replaced by men with less training. It seems, therefore, that this aspect of the situation should be given some consideration in order to prevent the deterioration of these teaching staffs, and of disrupting the research they may be carrying on.

After the last war, our Engineering Faculties were, in general, considerably weaker technically than they had been at the opening of the conflict. Many engineers who went into service or industry did not return and the colleges were faced with training new staffs in order to handle the tremendous influx of G.I.'s. At the same time, they had very few potential candidates from which to draw and all were bidding against each other. It has taken about five years in order for these staffs to get back to their normal competent pre-war level.

During the last conflict, Russia did not close her technical schools; Germany closed hers only after the battle of the Bulge and England had learned her lesson in the first World War. It seems then that if the Engineering schools are to continue to train a minimum of 30,000 replacements for Industry and the Armed Forces per year, and perhaps even more than this during emergencies when production reaches an all time high, it is absolutely essential to keep the well trained staffs in the colleges on a firm footing and not to deplete them. We certainly cannot match the manpower of our potential enemies and must rely on our superior technical skill and productive capacity, which contributed so much to victory of the last *two* wars.

These comments are not intended to imply that all on Engineering Faculties should be granted deferments or shown partiality, but certainly their cases should be reviewed with great care to determine whether they can contribute the most good to the Nation by remaining on Faculty staffs or by going into the Armed Forces and performing specific jobs for which their particular training and experience fit them and in which they know their talents will be used.

D. H. PLETTA, P.E., Head
Dept. of Applied Mechanics
Virginia Polytechnic
Institute,
Blacksburg, Va.

Rebuttal . . .

Dear Editor:

I was very interested in reading Mr. John E. Lane's letter in the November issue of the AMERICAN ENGINEER. Mr. Lane, in referring to the article, "Is Engineering a Profession?" which appeared in the September issue, apparently feels that engineering is not a profession.

From his letter, he seems to base his opinion on the fact that we call steamfitters, radio mechanics, boiler tenders, and locomotive drivers, "engineers." Mr. Lane further states, "When we speak of a doctor, we mean a person who is a college graduate of a medical school and who has received official state permission to practice medicine." I cannot quite agree with this because the medical profession encounters the same difficulties which the engineering profession is encountering. When people speak of a doctor, they do not always mean the medical graduate licensed to practice medicine. We have doctors of psychology, chiropractors, naturopaths, chiropodists, etc., etc., and I believe the salutation of "doctor" greets the average drug clerk much more frequently than the title of "engineer" is conferred on radio repairmen, steamfitters, etc., by the public.

The Medical Doctor is not worried about the other "doctors" who do not belong in his profession. He supports the American Medical Association and helps it to help him. He has raised himself to such a high level ethically and professionally that he is readily identified as a professional man. The Professional Engineer has his Canons of Ethics as his guide. He has the N.S.P.E. as his champion. He, too, can come out of his technical isolation long enough to do some valuable public relations work in the interest of his profession.

To my mind, the remedy does not lie in selecting some significant Latin or Greek word to replace the word "engineer." The solution lies, instead, in an all-out effort by every member of the N.S.P.E. to recruit new members from the Professional Engineers in his territory, to encourage registration among his non-registered friends and associates, and, by his support, to help the National Society of Professional Engineers do the same thing for the engineering profession that the American Medical Association has done for the medical profession.

Let's face it and work—not dodge it and shirk.

A. BURTON METZGER, P.E.,
Baltimore, Md.

The PE And Hospitals . . .

Dear Editor:

Congratulations on your most excellent article in the November 1950 issue of the AMERICAN ENGINEER, entitled "The Hospital Engineer."

I have been teaching along the lines of mechanical equipment of buildings for the last twenty-five years and have served as consultant to dozens of hotels (and a few hospitals) during that time. It is needless to say that my ideas runs along parallel lines.

Your article contains so much of sound value that I hope the author can induce the editors in the hospital magazine field to print it, or a similar one, so that it will reach hospital administrators all over the country. There is an unnecessary amount of "red ink" on the financial pages of too many hospitals.

FRANK H. RANDOLPH, P.E.,
Professor of Hotel Engineering,
Cornell University

Dear Editor:

I have just read with great interest the article, The Hospital Engineer, by J. A. Millard, in the November 1950 issue of your fine magazine.

The Navy Department believes, as does Mr. Millard, that daily application of engineering principles by properly trained professional engineers is required for the efficient maintenance and operation of hospitals in general and Navy Hospitals in particular. It was therefore disturbing to note that, in illustrating Mr. Millard's article, a photograph of the ex-Naval Hospital at Dublin, Georgia, was used, with a caption indicating that engineers are needed at that hospital. When the Dublin, Georgia, hospital was in operation by the Navy, an officer of the Civil Engineer Corps was stationed at that activity in the capacity which Mr. Millard discusses in his article. The Dublin, Georgia, hospital was transferred to the Veterans Administration after World War II and is now operated by that Administration.

Officers of the Civil Engineer Corps, who are graduate engineers and fully qualified to discharge the duties of "hospital engineer," are assigned to all major Naval Hospitals currently active. It would be greatly appreciated, therefore, if this point were to be clarified in future issues of the AMERICAN ENGINEER.

P. CORRADI,
Comdr., (CEC) USN

▶ The AE, well aware of the Navy's excellent work in hospital engineering, regrets it implied naval hospitals lack trained engineers.—Editor.

BOOK LOOKS

Title of Book: Survival Under Atomic Attack.
Published by: United States Government Printing Office. Price, 10 cents.

The first page of this challenging and informative booklet says: "You Can Survive. You can live through an atom bomb raid and you won't have to have a Geiger counter, protective clothing, or special training in order to do it. The secrets of survival are: Know the bomb's true dangers. Know the steps you can take to escape them." The pamphlet then proceeds simply and logically to explain the true nature of the atomic bomb and its consequences, and offers the reader suggestions aimed toward atomic survival.

The booklet offers no false hope, but is comforting in that it offers a concrete course of action to be followed in an atomic attack, rather than confusing the reader with a mass of technical information, as has so often been the case in previous publications of this type.

This booklet was prepared by the Civil Defense Board of the National Security Resources Board, and bulk copies may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Individual copies are for sale at 10 cents each.

Title of Book: William Strickland.
Author: Agnes Addison Gilchrist.
Published by: University of Pennsylvania Press. Price, $10.

"William Strickland," a recent publication of the University of Pennsylvania Press, is a beautifully bound volume dealing with the life of one of America's foremost architects and engineers of the first half of the nineteenth century.

Strickland was known for the practicality of his plans and the sound construction of his buildings. His most noted architectural works are the Tennessee State Capitol, the Second Bank of the United States and the restoration of the tower of Independence Hall in Philadelphia. He was primarily a Greek Revival architect, using the plates of "The Antiquities of Athens" for his inspiration, but stylistically he was a revivalist, using Gothic, Egyptian, Saracenic and Italianate.

A man of diversified interests and rare achievements, Strickland was also a distinguished civil engineer and one of the first to advocate the use of steam locomotives on railways.

On reading Strickland's biography, the reader feels that his life approximated that of the Renaissance "whole man" at least from an artistic point of view, as he did surveying, engraving of landscape and portrait paintings, and theatrical scene painting in addition to his architectural and engineering activities.

Possessed of wittiness, sincerity and great personal charm, Strickland also had a great deal of perseverance, based on optimism rather than tenacity. Beset by many disappointments, he nonetheless went on to contribute his talents to the design and construction of many American buildings.

William Strickland died on April 7, 1854, at the age of 64. He was buried in a niche in the north portico of the Tennessee State Capitol, since the legislature had passed a resolution that he should be so honored.

"William Strickland" would be a beautiful addition to any private collection of engineering history, and if you are an educator, you would do well to request this work for your library.

Title of Book: Famous Engineers.
Author: Sara Ruth and Emily Watson.
Published by Dodd, Mead & Company. Price, $2.50.

Here is a book that will make an ideal Christmas gift for your children. "Famous Engineers" is interestingly written, and tells the life stories of sixteen world-famous figures who made significant contributions to our civilization. The opening chapter presents John Smeaton, builder of the first modern lighthouse, and first British civil engineer of the eighteenth century. The succeeding chapters tell the life story and accomplishments of such famous engineers as Matthew Boulton, Thomas Telford, Peter Cooper, Robert Stephenson, John August Roebling and Son, George Washington Goethals, Lillian Moller Gilbreth and D. B. Steinman.

The authors' father was an eminent bridge engineer and their chief interests have centered around engineering and architecture, on which subjects they have written and lectured extensively.

Although the jacket says "for boys and girls from 10 to 14," chances are here's one gift Dad will be interested in looking through also.

Title of Book: Practical Television Engineering.
Author: Scott Helt.
Published by: Murray Hill Books. Price, $7.50.

Here is a sound and detailed engineering treatment of television, fully acquainting manufacturing and sales engineers, broadcast engineers, students, and technical workers in this field with all components of television transmitting and receiving, how they work, and how they are combined in the complete television system.

Both transmitting and broadcasting problems are emphasized, in a thorough and plainly written treatment that covers both the theoretical and practical aspects of television engineering.

This book is based on extended and practical field experience in installing and operating modern types of studio and transmitting equipment. It explains fully the circuits, construction, performance, etc., of all parts of the television system as a guide to all concerned with the fundamentals and methods of efficient practice in this field.

Well qualified to compile this book, Mr. Helt is a member of the Research Division, DuMont Laboratories, Inc., and Instructor in Charge, Principles and Practice of Television, Columbia University.

Title: Process Engineering.
Author: William H. Schutt.
Published by: McGraw-Hill Book Company, Inc. Price, $4.

The purpose of this book is to train any reader who is thoroughly familiar with time and motion study and can read blueprints to become a process engineer.

Process engineering as referred to in this book as that phase of industrial engineering which determines the means, the methods, and the procedure of manufacturing an article economically. It determines the best sequence of operations, the tools and fixtures to be used, and their cost, and designates the type and cost of the machinery or equipment.

Title: Pumice As Aggregate for Lightweight Structural Concrete (University of New Mexico Publications in Engineering No. 4).
Published by: University of New Mexico Press. Price, $1.

This bulletin is the result of research work done by the Civil Engineering Department of the University of New Mexico for the Atomic Energy Commission.

Around The Nation With Our Members

Fairman Speaks To Texas Chapter And Urges Unification

A unification of the engineering professions was urged by James F. Fairman, P. E., recently, in a speech before students and professional engineers in Texas Tech's Aggie auditorium in Lubbock, Texas, on October 27.

Engineers could serve the public better with a single organization comparable to the American Bar Association, Fairman said. He added that some start has been made toward unification of the engineering profession in the National Society of Professional Engineers. Further, he encouraged such organizations as the Texas Tech Engineering Society.

Fairman spoke following a barbecue in his honor at which Mrs. Fairman was also honored. The meeting was sponsored jointly by the Texas Tech Engineering Society and the South Plains Chapter of the Texas SPE.

New York Chapter Holds Fall Meeting At Statler In NYC

The New York Chapter of the NYSSPE held its first fall meeting on October 5 at the Statler Hotel in New York City. "Profit Through Professionalism" was the subject under discussion by two members of the chapter, Mr. Harold H. Funk, P.E., and Mr. Charles N. Metcalf, P.E.

Mr. Funk, recently elected a Vice President of the Hudson and Manhattan Railroad Company, has made a careful study of the factors involved in making money and the potentialities of professional organizations. He outlined his "Master Plan" for professional development and gave a picture of what the Society has been able to accomplish for the engineering profession.

Mr. Metcalf, detailed what the New York State Society has been doing for Engineers-in-Training and told of the opportunities for this group to help themselves and the professional engineering movement through membership.

Convention Head

Art Fryer, P.E.

Ohio Society Plans Useful Annual Convention

An all-time record attendance of a thousand is the goal set for the Ohio Society's 72nd annual convention in Toledo, Ohio, March 29, 30 and 31, according to the convention's general chairman, Mr. Art Fryer, P. E.

In an attempt to utilize all the opportunities afforded by a convention for the engineer's enlightment and entertainment, Fryer is making an especial effort to provide a well-rounded agenda.

"We realize that speakers and forums form a vital part of the convention agenda," Fryer said, "but we also feel that not enough consideration has been given to the benefits to be gained from careful study of exhibits and from informal talk between individual engineers in the corridors, the lobby, the hotel room. All of this pays extra dividends in a profession such as ours."

"For this reason," he added, "we have specifically allotted time from each convention day for the examination of exhibits. They have an important story to tell, but it's not going to be assimilated by a cursory glance. We have set aside specific time for the purpose of seeing these exhibits and thus made them an integral part of our convention, not just a side line."

Fryer further stated that time is also being provided for the engineers to get together and talk over their mutual problems and interests. "We must remember that they can come away with a lot of answers from such impromptu sessions," Fryer said, "so these discussions should be made an important part of every convention docket."

Moreover, provision is being made for the inclusion of the engineer's wife in the convention. First, special entertainment has been provided for her, and secondly, several of the meetings which her husband will be attending have been so arranged as to include her. This is designed to serve the dual purpose of making her feel at home and giving her a fuller understanding of her husband's work and the problems he must meet.

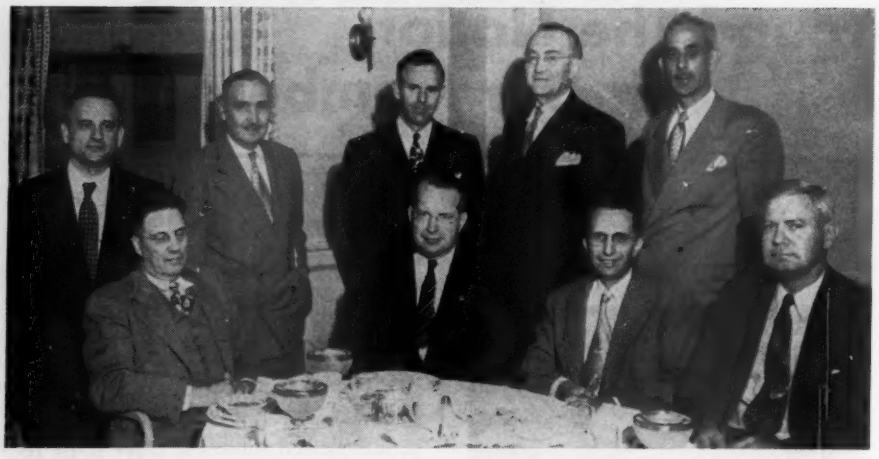
Fryer concluded by saying, "With the innovations we have made in our convention schedule, we're striking at the elimination of that post-convention let-down. We want every engineer to go away with the satisfied feeling that he's picked up some good thoughts—ideas that are really going to mean something to him in his work for the coming year.

Support The Public Relations Fund Drive!

Philadelphia Chapter Member Receives Drexel Alumni Award

Mr. Francis S. Friel, P. E., member of the Philadelphia Chapter, PSPE, was awarded the Drexel Alumni Association Award on October 7 at the annual homecoming dinner of the Drexel Institute of Technology at the Penn-Sheraton Hotel in Philadelphia.

Friel, a member of the firm of Albright and Friel, is a member of Drexel's board of trustees and a 1916 graduate of its evening school. The award is given for efforts on behalf of Drexel or the alumni association.



Scene at recent Joint Committee meeting of Architects Society of Ohio and Ohio Society of Professional Engineers, held October 6 in Columbus. Seated, left to right: Edward Larson, Vice-President, ASO; John Hargrave, Secretary, ASO; Lloyd A. Chacey, Secretary, OSPE; John J. Heier, Past President, OSPE. Standing: George S. Voinovich, President, ASO; Ralph C. Kempton, Executive Secretary, State Board of Examiners of Architects; C. Curtis Inscho, Past President, ASO; Carl C. Britsch, 1st Vice-President, ASO; and George Clark, President, OSPE.

Architects and Engineers Meet Jointly in Ohio

A Joint Committee meeting of the Architects Society of Ohio and the Ohio Society of Professional Engineers was held on October 6 at the Deshler Wallick in Columbus, Ohio. By common consent, on the suggestion of George Clark, President, OSPE, Mr. George Voinovich, president of the ASO, was named Chairman and Lloyd Chacey, Executive Secretary of the OSPE was named as secretary.

The meeting was opened by a general discussion of the situation created recently when the Supreme Court of Ohio upheld the claims of State Auditor Ferguson that the State Director of Highways did not have the authority to employ private engineering firms. This particular matter was discussed in detail as it affects both professions now, and what the precedent might mean in the future. The two Societies agreed that this was of sufficient importance to warrant immediate and positive action by both groups. To carry out this action, the Executive Committees of both Societies are to be requested to take such steps as might be found necessary to set up the authority for governmental agencies to employ professional services of architects and engineers on a negotiated basis.

Another subject of vital interest was the discussion of the recommended professional fees to be charged between Architect and Engineer, Engineer and Engineer, and Engineer and Client. The schedules of both professions were distributed for general review and comparison, with the purpose of having differences and inconsistencies brought to the attention of the Joint Committees at their next meeting.

As a joint effort worthy of immediate attention, it was suggested that a compendium of all laws affecting both professions should be prepared not only as a record but for review and checking to keep them up-to-date.

In order that a desired collaboration between the two groups might be effected, it was unanimously agreed that this Joint Committee should be set up on a permanent basis, with approximately six representatives from each profession. In this way, the six chapters of the Architectural Society would be represented, and although the Engineers have 27 chapters, they will limit their representation to six members in order to keep the size of the committee to a workable number.

Minneapolis Chapter Cleans Up Engineer Telephone Listings

The Minneapolis Chapter of the Minnesota Society has been working recently to clear up discrepancies in engineer listings in the classified section of the telephone directory. Working with Northwestern Bell Telephone Company officials and Lewis Anderson, attorney for the board of registration, the Chapter has succeeded in the peaceful elimination of 22 listings of non-registered persons and firms without registered personnel under engineer classifications.

Fair Stood the Wind— 'Till Psychic Waves Took Over In Arizona

A delegation of members from the Southern Arizona Chapter, ASPE, from Tucson, accepted the invitation of the Central Arizona Chapter, ASPE, at Phoenix, to attend their meeting on September 18. One stipulation of the Tucson group, however, was that the Phoenix engineers do something about the high temperatures in Phoenix.

Accordingly, the Board of Trustees of the Central Chapter started thought waves to lower the Phoenix temperature for the occasion. About noon of the day in question gentle rain fell and the temperature likewise started to fall. However, some member, in his air-conditioned office, failed to notice the change in the weather outside and was still thinking of the Tucson request. At 1:08 PM another storm developed on the southern edge of Phoenix and swept across the eastern section of the city with winds up to 90 miles an hour and hail stones up to three inches in diameter. About 5 PM another rainstorm further cooled off the streets, sidewalks and roofs so that the Central Chapter was able to provide the Tucson Engineers with 75° weather for the meeting. The Phoenix Engineers offered their regrets to the Tucson Chapter and the citizenry of Phoenix for being a party to the worst and most damaging storm to hit Phoenix in the last twenty-five years.

Albany County Chapter Hears Address On Atomic Bomb Effects

The Albany County Chapter of the New York State SPE held its monthly meeting on November 21 at Pentta's Restaurant in Menands, New York. A motion picture "Atomic Destruction to Structures — Medical Cases — Part I" was shown as part of the program.

The other feature of the program was an address by Mr. Stanley T. Barker, P. E., Assistant Director for the Bureau of Environmental Sanitation for New York State, on "Effects of Atomic Radiation on Personnel and Materials."

Mr. Barker explored the effects of atomic bombing from air bursts over cities, and under-water bursts near populated areas. He is a member of the Albany County Chapter and has lately been associated with General Lucius Clay's Defense Staff Committee for New York.

Albuquerque Chapter Hears Address On Collective Bargaining

The Albuquerque Chapter of the New Mexico Society met recently at the Science Lecture Hall of the University of New Mexico. Collective bargaining for engineers was the topic of the evening's discussion, and the guest speaker was Mr. Alex Van Praag, P.E., Past President of NSPE.

Mr. Van Praag was well qualified to speak on this subject as he has been an engineer working for others and has also carried on as a consulting engineer who has employed many other engineers during a quarter of a century. He discussed the provisions of the Taft-Hartley Bill in relation to the engineer, pointing out that the Bill says the engineer's decision to join or not to join a union is entirely a personal one. In addition, Van Praag said that the National Society is forbidden by law to act as a bargaining agent, as such, as the Taft-Hartley Bill specifically forbids any society which is made up of both employers and employees from so acting.

Van Praag further pointed out the steps the Society could take to combat pressure being exerted against the individual engineer to join a union.

Support The Public Relations Fund Drive!

New Jersey P. E. Carroll Awarded Gilbreth Medal

Mr. Phil Carroll, P. E., member of the New Jersey Society, received the Gilbreth Medal for 1950 from the Society for Advancement of Management on November 3 at the society's annual conference at the Hotel Statler in New York.

Carroll was selected for the award due to "his noteworthy achievements in the field of motion, skill and fatigue." An industrial engineer, he has made outstanding contributions to the method of work measurement in that field.

He is the author of textbooks and articles on management controls, work standards and cost practices and elimination of fatigue in industrial work.

The medal is awarded in honor of the late Frank B. Gilbreth of Montclair, New Jersey, who was a time study engineer. Among those who have received the award since it was established by Mrs. Gilbreth 18 years ago is former President Herbert Hoover.

Second Anniversary Banquet Held By Virginia Chapter

The Second Anniversary Banquet of the Northern Virginia Chapter, Virginia Society, was held in the Virginia Room of the George Mason Hotel in Alexandria on October 27.

The main feature of the evening was an address by the Honorable Andrew W. Clarke, State Senator from Northern Virginia. Mr. Clarke's address dealt with the engineer and his part in preserving American principles and ideals.

In addition to Mr. Clarke's address, Chapter President Herbert Manuccia gave a summary of the activities conducted this year by the Chapter and the program concluded with the installation of new officers.

Capital Chapter Of Illinois Meets In Springfield

The monthly meeting of the Capital Chapter of the Illinois Society was held at the Mill in Springfield on October 24. Mr. Edward A. Kane, State President of the Architects Association of Illinois, was the guest speaker of the evening.

Professional relations between architects and professional engineers was the subject under discussion at the meeting and all architects of the area received a special invitation to be present.

Army I. Q. Standards Lowered—Engineering Students Rate High

The United States Army has lowered its I.Q. standards to 70, in contrast to a previous I.Q. requirement of 90. The Army has found that science or engineering graduates have an average I.Q. of 128, and that A students in science or engineering have an average I.Q. of 145. This is probably the reason why so many engineering graduates were accorded the distinction of being drafted as privates in the last war. By contrast, the American Medical Association requires that no medical school graduate may be drafted unless a commission as a Captain or Lieutenant Commander is granted.

Arkansas Engineer Christian Passes Away in Little Rock

Mr. Charles S. Christian, P. E., age 70, died at a Little Rock, Arkansas hospital October 10.

Mr. Christian, a Civil Engineer, came to Little Rock from Texarkana, Arkansas, in 1928 as Chief Engineer for the State Highway Department. He retired from that post in 1931, and during the war he headed the Arkansas War Assets and War Production Boards.

Mr. Christian will be remembered by many NSPE members as the National Director from Arkansas from 1938 until 1944. He was the first National Director of the Arkansas State Society, a charter member of the Society and was active in Society affairs until his death.

Bay Area Chapter, CSPE, Hears Talk On Atomic Power

The Bay Area Chapter of the California Society met on October 18 at the James Waters Auditorium in San Francisco. The program featured an address by Dr. Lester E. Reukema, professor of electrical engineering, University of California. His subject was "Atomic Power to Supply Man's Needs For Eight Billion Years."

Dr. Reukema is a member of the Research and Development Board, Washington, D. C., Consultant for the U. S. Navy, and is connected with numerous important projects.

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Hamor of Pittsburgh Chapter To Receive '50 Pittsburgh Award

William A. Hamor, P. E., Assistant Director of Mellon Institute and member of the Pittsburgh Chapter of the PSPE, has been named by the Pittsburgh Section of the American Chemical Society to receive its Pittsburgh Award for the year 1950. The award, a bronze plaque which is granted annually for outstanding service to chemistry, will be presented to Dr. Hamor at a dinner in the University Club of Pittsburgh on December 21.

In a long and productive career, Dr. Hamor has achieved prominence for his noteworthy accomplishments in research management, and for his authorship and editorship of numerous scientific publications. A graduate of the University of Pittsburgh, he has received honorary doctorates from the University of Pittsburgh, Grove City College, the University of Louisville, and the University of Miami. Since 1947, Dr. Hamor has served as Editor of Chemical Monographs for the American Chemical Society. He is a member of various other technical societies and has served on several important governmental agencies, including the Scientific Personnel Committee of the U. S. Atomic Energy Commission and the Scientific Manpower Branch of the War Department, General Staff. He is also a member of the Research Advisory Council of the Industrial Hygiene Foundation of America.

Wilson of General Motors Addresses Detroit Chapter

The Detroit Chapter of the Michigan Society met on November 8 in the auditorium of the Rackham Memorial Building in Detroit. The speaker of the evening was Mr. Charles Erwin Wilson, President of General Motors Corporation, and his topic was "Social Responsibilities of the Professional Engineer." The address was followed by a question and answer period.

Mr. Wilson is one of America's most distinguished leaders in industry, and is also an outstanding leader in the field of human relationships.

Support The Public Relations Fund Drive!

Southern Arizona Chapter, ASPE, Meets in Tucson

The Southern Arizona Chapter of the Arizona Society held its monthly meeting on October 20 at the El Presido Hotel in Tucson. Mr. Gene Magee, P. E., presented a speech on "Photography and Engineering," and Chapter President Charles B. Maguire, P. E., read a letter which he had written to the Tucson City Council and to the Pima County Board of Supervisors, in which the services of the Chapter were offered toward civil defense.

Delaware Society Announces Names Of New Officers

The newly-established Delaware Society of Professional Engineers recently announced the names of its new officers and directors, who were elected on October 11. They are as follows: J. L. Bahr, President; M. Allan Wilson, Senior Vice President; C. H. Evans, Vice President; A. L. Bolton, Treasurer; J. D. Waddell, Secretary; T. B. Evans, National Director; L. Blumberg, Director; E. S. VanDemark, Director and R. D. Rodgers, Past President.

Dr. Rodgers was unanimously elected to fill the vacancy of Past President in recognition of his position as President of a defunct predecessor organization, and because of his continued enthusiasm and interest in the new organization. In addition, Dr. Rodgers has the unique distinction of being a Registered Professional Engineer in more than 40 states.

On the invitation of S. L. Stolte, President and Allan G. Stanford, Past President, National Society of Professional Engineers, the Delaware Society was represented at the Little Rock, Arkansas Board of Directors meeting on November 3rd and 4th by J. D. Waddell, Secretary.

All State Societies are invited to contribute helpful information and suggestions toward the success of this Society. The new address is: P. O. Box 1848, Wilmington, Delaware.

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A Reminder . . .

BY now you know something of the public relations fund raising program that NSPE is conducting. If you will study the folder recently sent you from National Headquarters, or if you will read again the article about the program as it appeared on Pages 12 and 13 of the October issue of the American Engineer, you will want to stand firmly behind NSPE's first effective activity in this vital field.

If you have not contributed thus far, do it TODAY! Give yourself a Christmas Present—one that will help you and your profession toward the recognition it so rightfully deserves. Engineers can PROGRESS but—

It's Up To You . . .

OUR 4-Point Public Relations Program Will Do These Things:

1. **Tell EMPLOYERS of the asset they have in you as a professional engineer. (This means YOUR employer for local Chapter lists will be used for contact.)**
2. **Sell industry and other users on the value of employing the consulting professional engineer engaged in private practice. (Local lists used.)**
3. **To urge educators to instill professional concepts and the values of registration in students.**
4. **Tell the general public about professional engineers.**

It's an ambitious program but it CAN BE DONE WITH YOUR HELP! Send in your check now. Remember, everyone contributing five dollars or more will receive without cost, the metal Professional Engineers Plaque suitable for attachment on an automobile. (Picture on opposite page.)

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PUBLIC RELATIONS FUND RAISING CAMPAIGN

Yes, I want to do my share toward building a greater engineering profession. I enclose $..... toward the Fund. I understand that everyone contributing $5.00 or more is to receive free the metal Professional Engineers Plaque suitable for attachment on an automobile.

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STATE AFFILIATION .....
(Be certain to PRINT all information asked for above. Include correct Chapter name so the group will receive credit for your contribution.)

News To Note

Georgia

The Macon Chapter of the Georgia Society met recently at the Lanier Hotel in Macon. Mr. C. W. Roberts, Vice President and General Manager of the Macon Division, Georgia Power Company, addressed the group on "Construction and Operation of Power Plants in Georgia." A film entitled "Power of the South" was also shown.

Pennsylvania

The Lehigh Valley Chapter of the Pennsylvania Society held a meeting on November 17 at the Owls Club in Allentown, Pennsylvania. Honorable James F. Henninger, Judge of the Court of Common Pleas for Lehigh County, was the guest speaker for the evening, and his topic was "The Engineer as a Professional Witness."

Texas

The Nueces Chapter of the Texas Society met recently at the City-County Health Unit auditorium in Corpus Christi.

Mr. W. A. Rock of the Foxboro Company presented an illustrated discussion of some of the elements of industrial metering.

District of Columbia

The District of Columbia Society met on October 23 at the Electric Playhouse of the Potomac Electric Power Company in Washington, D. C. The feature of the evening was a presentation by The Electric Institute of Washington on the uses of electricity in modern day living.

New York State

The October meeting of the Monroe Chapter, NYSSPE, was held at the Hotel Rochester, Rochester, New York. The usual dinner and get-together were held preceding the meeting.

The speaker of the evening was Mr. Thomas E. Hibben, Economic Development Adviser of the U. S. Department of Commerce who talked on President Truman's Point Four Program.

Ohio

The Marion Chapter of the Ohio Society held its November meeting at the Greenwood Inn in Marion on November 13. The speaker of the evening was Mr. Harvey Gracely, President and General Manager of the Marion Power Shovel Company, Marion, Ohio. His subject was "The Development and Use of Power Shovels."

California

The Stanislaus Chapter of the California Society met on October 28 in the Banquet Room of the Hotel Hughson in Modesto, California. Guest speaker for the evening was Mr. Paul H. Robbins, President, NSPE, who spoke on "Our Professional Society."

Colorado

The Professional Engineers of Colorado held a meeting on November 15th at the Argonaut Hotel in Denver. Dinner was held at 6:00 followed by the showing of two movies, "How To Build A Dam In 3 Easy Steps" and "Also Woodchopping."

Pennsylvania

The Midwestern Chapter of the PSPE met on November 4 at the Willard Hotel in Butler, Pennsylvania. Marcus McCulloch was the guest speaker and his topic was "Korea As I Saw It."

Ohio

The Dayton Chapter of the Ohio Society met at the Engineers' Club in Dayton on November 1. The guest speaker was the Reverend Harvey Hahn of Dayton and his subject was "Balanced Living."

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Positions Open

As a special service to its readers, the *American Engineer* presents the following list of job openings.

Engineers, GS-11 — Mechanical, structural, architectural. For further information, write District Public Works Office, 12th Naval District, Federal Office Building, San Francisco 2, California.

Electronic Engineer and Physicist, GS-9 to GS-14—Board of Civil Service Examiners at either U. S. Navy Underwater Sound Lab, Fort Trumbull, New London, Connecticut, OR Air Force Cambridge Research Laboratory, 230 Albany Street, Cambridge 39, Massachusetts.

Engineers, GS-9—General, electrical, structural, mechanical, civil, and engineer specification writer. Also Mechanical engineer, GS-11. The initial salary rate for a GS-9 is $4,600 per annum and for a GS-11 $5,400. Further inquiries should be addressed to Public Works Office, Fifth Naval District, Norfolk 11, Virginia.

Macon Chapter of GSPE Tours Plant During Recent Meet

The members of the Macon Chapter of the Georgia Society, and their guests, toured the Blue Bird Body Company at Fort Valley, Ga., at their meeting on October 9.

Following the tour of the plant, a barbecue dinner and entertainment were held at the American Legion Home in Fort Valley.

Wisconsin U. Plans Series of Eighteen Engineering Institutes

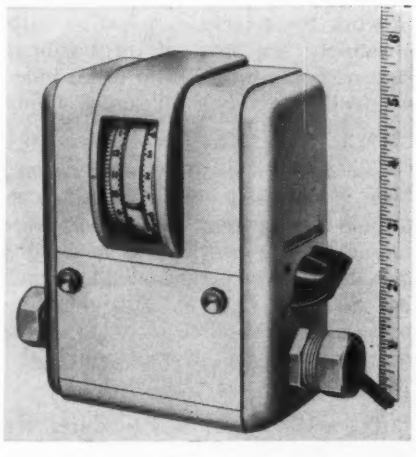
The University Extension Division and the College of Engineering of the University of Wisconsin are planning a series of 18 engineering institutes to provide additional technical training. These institutes are to be held on the University campus during the period November, 1950 to June, 1951. Each institute is planned to give instruction of a basic nature and information about latest developments and improved techniques in the field covered. The instructional staff will be made up of men in industry and faculty members of the college of engineering and the extension division.

Enrollments for most institutes are limited. Inquiries concerning any of the institutes should be directed to Professor H. E. Pulver, University Extension Division, Madison, Wisconsin.

What's New

As a service to our readers, this column will describe briefly new product developments of general interest to professional engineers. When writing manufacturers, we will appreciate your mentioning the American Engineer.

● Basic Products new Model X-1000 Commercial Defroster and Automatic Time Control combines simplicity and flexibility in a single, compact, inexpensive unit for a wide range of applications.



This latest addition is unique in the methods by which the time periods are controlled. Four different interval combinations may be set from the outside by a single dial control. Each interval is variably controlled and infinite from 5 minutes up to the length of the period selected.

Setting is done with two dials, eliminating the adjustment of inside pins, cams and levers. The working mechanism is driven by a synchronous motor, eliminating any gears and featuring fewer working parts.

For further information write Basic Products Corporation, 1617 North Harrison Street, Fort Wayne 7, Indiana.

● A self-sprung towed-trailer axle unit which makes possible substantial savings in commercial and house trailer manufacturing costs is announced by American Steel Foundries of Chicago.

The axles can be installed singly or in tandem. The design permits use of conventional wheels, hubs, roller bearing and brakes, if required. It eliminates the need for conventional spring-axle assembly components, making savings in original cost and in installation.

Should one spring be damaged, the other carries the load. Should this occur to both springs, operation continues as a dead axle unit.

For further information write American Steel Foundries, 410 North Michigan Avenue, Chicago 11, Illinois.

● A new, compact, portable bench grinder, ideal for grinding and sharpening jobs, has been announced by Portable Electric Tools, Inc., of Chicago. Known as their Model 400 Hi-Power Bench Grinder, this new grinder incorporates many noteworthy design features and conveniences such as: powerful, fan-cooled, 110-120 volt, single-phase, 60-cycle, 3500 rpm. motor with precision, dynamically balanced rotor for smoothest running; two fully adjustable took rests; convenient on-off toggle switch built into front of motor housing: lightweight, die-cast motor housing with integrally cast wheel guards, and base with no-creep rubber feet.

This bench grinder is available also as a package with adapter and drill chuck, buffing wheels, sanding discs and polishing bonnet and wire wheel brush for buffing, drilling, polishing, sanding, and brushing.

Further particulars and descriptive literature are available from Portable Electric Tool, Inc., 320 West 83rd Street, Chicago 20, Illinois.

Profession

(*Continued from page* 13)

the doctor get this automatically due to the controversial nature of man, and due to the ailments inherent in his nature.

The accountant had to use a little ingenuity to get over the hump, not much, but enough. Very early in the game, he invented auditing, the verification of business transactions, which he performs in the same way, for the same people, year after year. That is the fountain spring of the accountant's power. Of course, he is careful to report it in a respectable medium, the Annual Report to Stockholders, right at the ear of the mighty, and so he becomes indispensable.

The engineer, who could figure out the Panama Canal and radar reflections from the moon, could never figure out a repeat package to sell to industry, even after the accountant showed him how, so the engineer became prisoner to the corporation. It was that or starve.

All that is needed to rectify this is a repeat package of engineering to sell to industry, and we will return to this, for synthesis produces several very easily.

The second key works this way: A doctor, a lawyer, or an accountant goes to work for a large corporation with absolutely no loss of professional stature, because the power of his independently practicing colleagues stands behind him.

The doctor tells the vice president: "No, I could not permit a layman to tell me how to paint these backs with iodine or to prescribe the new wonder drugs. Our ethics don't permit it." So the V. P. says, "All right, Doctor, we'll hire another doctor to supervise, or better still, promote you to the job."

The accountant works similarly. He says "This thing I'm advising you against is a direct violation of our accepted accounting principles, and my colleagues, the independent auditors, will raise merry Gahemma about it."

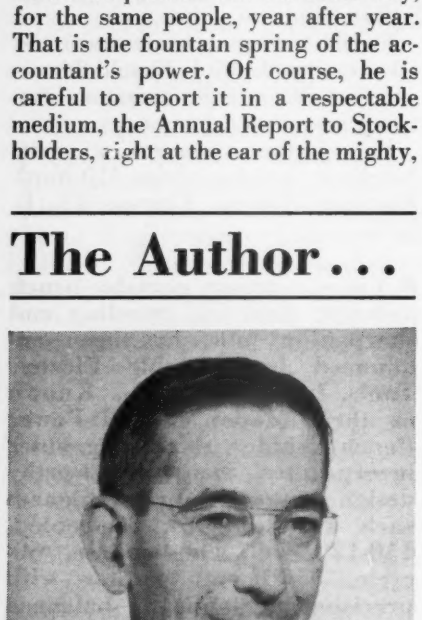
But you see the point. The sine qua non, the indispensable ingredient, is that there must be a very considerable body of independent practitioners, not some fraction of one per cent, as in engineering.

Now we get down to the neck of the bottle. If the accountant, devoid of mathematics above arithmetic and entirely without natural science, could, through his genius, raise bookkeeping to a true profession by the simple means of a repeat package, why can't the engineer do the same thing? The rewards are great.

But it is difficult to make rabbit stew without the rabbit, the repeat package.

It so happens that there is a great gap between engineering and accounting, and in this gap practically all the tragedies of industry occur, including defective costs, ineffective thief-proofing, saddening research methods and a long list of public utility financial errors. An engineer who couldn't make a repeat package out of mess like that, after his attention is called to it, is no engineer. Should you become interested in this, the writer would be glad to help you.

The Author . . .



Pilson W. Kelly, P. E.

Pilson W. Kelly, P.E., is a member of the Audit Committee NYSSPE; M. E., Stevens '25; C. P. A. (N.Y.) and member of the Controller Institute. He has served the N. Y. Public Service Commission as Associate Engineer; the Federal Communications Commission as Expert Accountant in Charge of Depreciation; and the City of N. Y. as Assessor of Electric Utilities, (Deputy Commissioner).

During the last war, Kelly had charge of cost problems for Army Ordnance in N. Y. and was later Controller of a manufacturing company. He has since been engaged in independent practice in Depreciation and Costs.

He speaks frequently over Fordham University's radio station, on financial research and public utilities problems.

Northeast Chapter Of PSPE Holds Dinner Meeting

The Northeast Chapter of the Pennsylvania Society held a dinner meeting on October 27 at the Fox Hill Country Club. After the dinner, a motion picture showing the devastation of Hiroshima and Nagasaki by atomic bombing was shown.

This picture was made by the Japanese and only recently has been taken off the restricted list and English narration provided. It was obtained for this showing from the State Civil Defense board by courtesy of the Red Cross and the Lackawanna County Medical Society.

Bay Area Chapter Of California SPE Holds Frisco Meeting

The Bay Area Chapter of the California Society of Professional Engineers held its regular monthly meeting on November 15 at the James Waters Auditorium in San Francisco.

The main topic of the evening was a full report and discussion of the Fee and Salaries Committee's recommendations, and another item on the agenda was a discussion on the possibility of forming two new Chapters in the Bay Area, one for East Bay members and the other for Contra Costa members.

Newly-Registered Engineers Honored By Memphis Chapter

The Memphis Chapter of the Tennessee Society of Professional Engineers gave a banquet recently, at which fourteen newly-registered Engineers were presented with their registration certificates.

Guest speaker was N. W. Dougherty, P.E., Dean of the College of Engineering at the University of Tennessee and also Chairman of the Board of Architectural and Engineering Examiners. Mr. Dougherty made the presentation of the certificates assisted by Major Thomas H. Allen, P.E., also a member of the board of examiners.

Los Angeles Chapter Hears Expert On Slum Clearance

The Los Angeles Chapter of the California SPE held a meeting on November 14 at the Institute of Aero Sciences Building in Los Angeles. The speaker of the evening was Frank Wilkinson, and his topic was "City Housing and Slum Clearance."

What They're Saying

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engineer may readily design to withstand tremendous side and roof loadings. Also, it is possible to make existing structures more resistive to the forces to be expected in case of an atomic attack. The structures may be strengthened against the lateral and downward blast forces — avoid types of material that would be hazardous to occupants when the buildings are subjected to blast.

New facilities may be placed underground or in an existing mine or cave where protection is absolutely necessary and the extra cost may be justified. It is necessary to evaluate the hazard, the importance of the facility, and the cost of protective measures to decide what procedure should be adhered to.

Shelter design must take into consideration the warning to be expected, time required for persons to reach the shelter, number of persons to be sheltered, period of occupancy and degree of protection to be afforded. In large cities the use of shelters designed into large buildings is feasible. Fireproof, reinforced concrete or steel frame buildings should be selected so as to have adequate protection against blast, radiation and flying debris. This will usually be on lower floors in the interior of the building. At least two exits must be provided for each shelter.

Outside shelters should be built to provide resistance to a nominal atomic bomb at ½ mile distance. This shelter should be well clear of buildings to avoid hazards from debris and fire. This shelter should be buried or semi-buried, reinforced concrete is usually most economical for this purpose. Culvert type steel when well buried is satisfactory to withstand heavy stresses.

Shelters should be designed to withstand a static load of 500 lbs. per square foot with doors that are blast resistant and capable of withstanding the same forces. Ramp entrances are preferable. At least 2 feet of dirt should cover the shelter to protect the occupants against ionizing radiation.

As an example of residential construction that may be built to offer resistance to blast, are the Normac House such as those built at Sandia Base and the Pyramid homes that have been successfully built in Albuquerque. Costs have been about 10% to 15% higher for the structural portions of the buildings when compared with frame and block construction. However, by the time this is taken as a proportion of the total cost of the building, it is only a small per cent increase in cost. Any building designed to be blast resistant would give the occupant the added protection necessary during hurricanes, tornados and earthquakes.

To summarize the ideas emphasized by the Steelman Report, we find:

1.—Dispersions and proper location of vital industries and services is of prime importance. An Atomic bomb is not all-enveloping and we can locate new structures so that to minimize the blast.

2.—Construction of new buildings may incorporate blast resistant design at little extra cost. Old construction may be strengthened and made fire resistant to cut down possible damage.

3.—We must plan now to provide emergency service in case of attack. Engineers should advise and be of all possible assistance to any civil defense set up.—*Jack Edwin Counts, New Mexico Professional Engineer & Contractor, June,* 1950.

(This is the third and final of a series of three articles reviewing the Steelman Report, and its points of prime interest to engineers and builders. This complete report is available from Superintendent of Documents, U. S. Government Printing Office, Washington 25, *D. C., for ten cents.)*

RESPONSIBILITY TO THE COMMUNITY . . .

The engineer's first responsibility is, of course, to be competent and diligent in his daily work for his employer or his client, but since engineering is a service to the community I think it may be said that in our daily work we discharge a responsibility to the community. The question before us is whether the engineer has any responsibility to the community beyond doing his job well and faithfully. We must remember that his job will not be well-done if it occupies only business hours. His knowledge of engineering cannot be too wide or too deep, and engineering is a very big, a very demanding and a very absorbing pursuit. When you consider further that the engineer must also find time for exercise, and that he has family and other private affairs to see to, he may very well ask how anything more can reasonably be asked of him.

And yet, if that be the whole answer, it becomes fairly obvious that the engineer must be content with a subordinate status in the community. Returning to the engineer's responsibilities, however, the disturbing question arises as to whether the community is getting all the benefit that it should from our profession, due to their lack of information concerning the field and its many resources. The community could, with advantage to itself, make fuller and better use of the engineer's services.

This, then, is the view I submit to you: that the engineer is responsible not merely for having the skill to "direct the great sources of power in Nature for the use and convenience of man," but that he is also responsible for seeing to it that man does, in fact, obtain every ounce of 'use and convenience' that the engineer's skill can furnish. He has to be not merely the engineer, but the ambassador of engineering to the community and its authorities.

Where, then, do we start? Does the engineer, individually and personally, gain the favorable attention of the community for himself? I heard a contrary view from the President of one of the Institutions, eleven or twelve years ago. He said that the engineer's unsatisfactory status had some justification in that they were apt to lack knowledge and appreciation of administrative and financial considerations, to be careless of dress, appearance and deportment, and to be wanting in social adroitness, negotiating ability and wider cultural interests. If we accept that criticism, there is a responsibility on each of us to correct those defects.

What next? We have to persuade the community to accept more and better engineering and to admit the engineer to a higher place in its councils. Persuasion depends not only upon our knowing our engineering. We must also know the community in all its aspects. And surely the way to get to know the community is to take a more active part in its general life.

Where, then, is the engineer to start to acquire more knowledge of the community? I suggest he start at the aspect which most attracts his interest, whether it be public speaking or archeological research.

Sensibly and attractively carried out, such a course could, I hope, lead to a public state of mind in which, when any project was mooted, the first thing people would want to know would be: "what have the engineers to say about it?" Then we could feel that we had begun to get somewhere; that our embassy was succeeding; and that our responsibility to the community was being creditably borne.

—By Robert Charlmers, OBE, B. Sc., M. I. C. E., M. I. Mech.E., from Journal of the Engineer's Guild, 1950.

After ECA, What?

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value exceeded exports. This dramatic reversal of the balance of trade means more dollars in the pockets of your foreign customers, and results in such announcements as that by the British Treasury, on October 3rd, stating that British gold and dollar reserves now total $2,756,000,000 — their highest level since World War II.

How long this condition will last is an open question, since the same forces which brought about the upward movement of dollar reserves are operating in other ways to bring them down. If the cost of materials has increased for the United States, it also has increased for other countries. And, this price increase applies to the goods which Europe must buy from us—as well as to the goods it sells to us. Furthermore, whatever defense production Europe carries out for itself is certain to affect to some extent the amount of consumer goods which can be supplied for domestic needs, and therefore will place a strain on the European economy.

Europe is assured of Marshall Plan aid until the official end of the program in 1952, at which time no one, not even an ECA official, expects that all of Europe's problems will be solved and the United States can go back to its own economic problems. There is little doubt that as a name the Marshall Plan will survive its announced deadline of 1952. We will be unable to sever our financial relations with Europe and other areas at any foreseeable date. I might point out that there has been no cessation in the flow of funds and materials to Europe since Lend-Lease.

The latest form of foreign aid is the Point Four Program, which was announced as a channel for technical assistance and private investment funds for underdeveloped countries. However, some twenty-one months after its announcement, Point Four still is not a going concern. It is clear that in its present form Point Four cannot serve as a successor to the Marshall Plan, which was designed mainly for rehabilitating highly industrialized countries of Europe rather than underdeveloped areas. In any case, the problem of financing such a program remains unsolved.

In the years following the end of the war, U. S. investors were sending abroad about a billion dollars annually. Much of that total represented the expenditures of oil companies in the Near East and Latin America. Especially after Korea, there is a little likelihood that the billion-dollar level can be maintained. The Export-Import Bank has been given limited powers to guarantee private investments abroad, and treaties providing for protection of investors are being negotiated with a score of countries. But such assurances offer little incentive to private capital in an insecure world.

There is a strong possibility that the Korean war will be used as a talking point for an attempt to turn Point Four into a governmental rather than a private program of aid to the Far East, Latin America, and Africa, on the premise that we must raise the standard of living in backward areas if we are to head-off political unrest. If this should come about, the outlook for exports will change again, and we may look toward India, Pakistan, Iran, and similar countries as fairly large markets for industrial goods.

All these countries have dozens of projects in basic industries and services which are only awaiting some means of financing, and in a large number of cases materials handling equipment will be involved. If the bars are let down to any degree on the funds available to the Export-Import Bank or other financing agencies, new markets for materials handling equipment will be created. Such equipment is often identified with advanced economies and mass production, but it also is vital in relatively backward areas wherever a basic industry or a source of raw materials is being developed. There is no better example of an underdeveloped area than the east coast of Africa. Yet the port of Lourenco Marques is scheduled to become an important shipping point for strategic ores from the interior, and it doesn't take a crystal ball to see that such a development will eventually mean orders for various kinds of apparatus.

But, meanwhile, another element already has entered the foreign trade picture. We are beginning to see the other side of the coin of Europe's economic recovery—the strong competition that its industries are offering throughout the world and in Europe itself. There have been many cases in which European concerns have been forty per cent or more under U. S. bids on certain types of industrial equipment. However, I expect that U. S. exporters will continue to make a good showing on the world market on the basis of quality, delivery, and even price.

In cases where the market seems extremely limited or even closed to your products, I recommend that you look into the possibilities of exporting your know-how in the form of license agreements with established manufacturers abroad, covering the use of designs and production methods. We might as well get used to the idea that the United States has no monopoly on brains. Recently, an air line executive told how he had sent a number of engineers to look over British developments in jet and turbo-prop engines. They reported that the British take a back seat to nobody in engineering and design, but that in aviation production methods Britain lagged far behind the United States. The same story would apply to many other industries. As far as my Company is concerned, we have found that both our designs and our production methods have found a ready market in countries which otherwise would offer us only a closed door.

I believe that the picture of foreign trade sketched for you, with all its complexities, clearly establishes that the phrase "The World is your Market" is not an empty one, for more and more goods are being moved to more and more places for more and more people today than ever before. Two years ago the Berlin Airlift gripped the attention of the world, as American and British planes and men successfully raised the siege of Berlin. As you know, an equally impressive airlift has been in progress in Korea for some months, which again is demonstrating the tremendous advances that have been made in the field of moving men and goods.

I think that the best way to describe the prospects for sales of your products in the world market is to say that wherever modern methods of mass production are being introduced —wherever new sources of raw material are being opened up—you have an opportunity to sell materials handling equipment.